FOUNDRY
EST. 1902
TRADE JOURNAL
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No. 2340 OCTOBER 12, 1961
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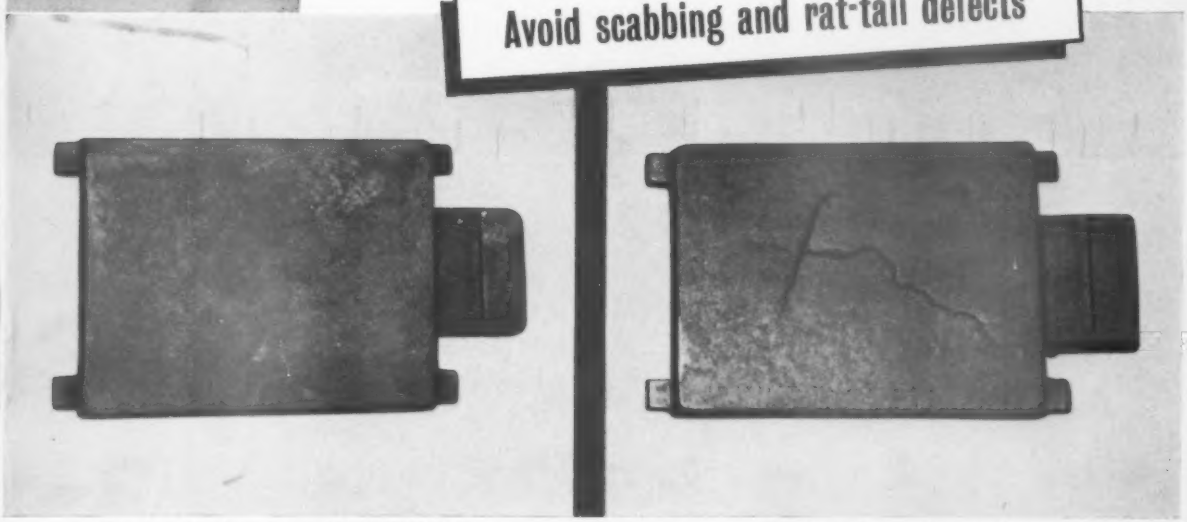
MAKE SURE YOUR FOUNDRY USES

BERKOAL

Avoid scabbing and rat-tail defects



Cast in synthetic sand containing BERKOAL *Cast in previous synthetic sand*

REPRODUCED BY PERMISSION OF R. & A. MAIN LTD., EDMONTON, WHO COLLABORATED IN THIS DEMONSTRATION

These photographs clearly show the effect a small addition of (say 2%) BERKOAL has in overcoming scabbing and rat-tail defects due to sand expansion. Ask Berk for a trial delivery and full technical data.

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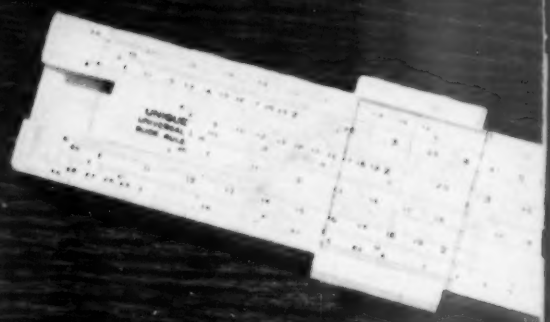

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Carbon	2.40 %	4.25 %
Sulphur	0.025	0.015
Phosphorus	0.025	0.025
Silicon	0.08	0.08
Manganese	0.009	0.009

RESIDUAL ELEMENTS

	%		%		%
Chromium	0.035	Titanium	0.020	Aluminium	0.015
Copper	0·025	Vanadium	0.025	Tungsten	0.001
Nickel	0.085	Cobalt	0·040	Molybdenum	0·001
				Tin	0.001

Sorelmetal is consistently uniform
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If you make cores up to 2 lb. you should use a Redford. It will make them quicker and cheaper than any comparable machine on the world market today.

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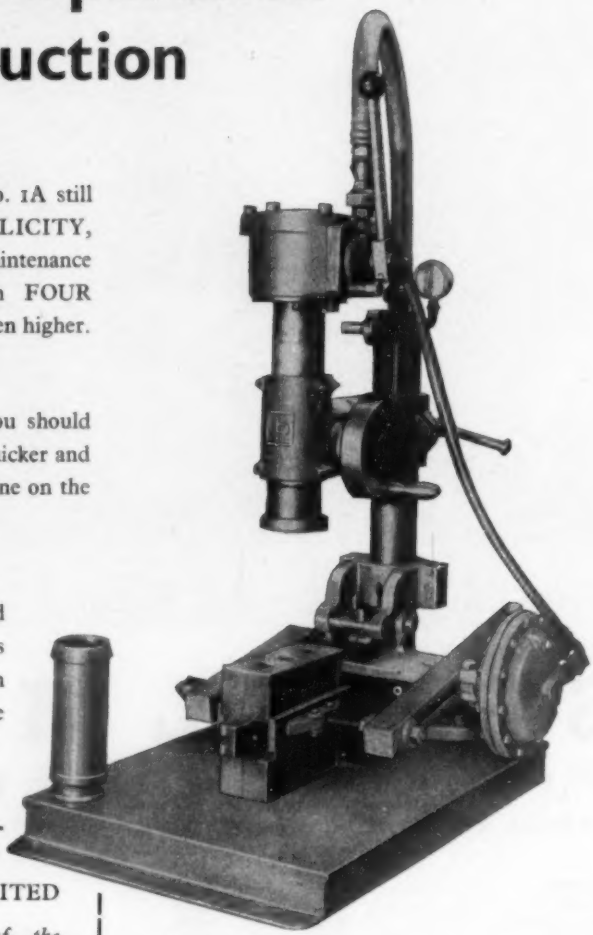

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Just attach to one of your letter-headings and post to-day to :—

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". . . and I might at that if a couple of teams I could mention were to buy themselves some decent centre forwards.

"Football is a funny game. One week a club is a world-beater and yet a few days later they can be licked to a frazzle by a team from a girls' school.

"Heaven help us if we carried on that sort of caper at AW. Customers don't want firms that are up one minute and down the next. When buyers come to a company with our reputation they expect—and get—a reliable performance. Fancy telling them that a load of pig wasn't up to specification because one of our furnacemen was off form!

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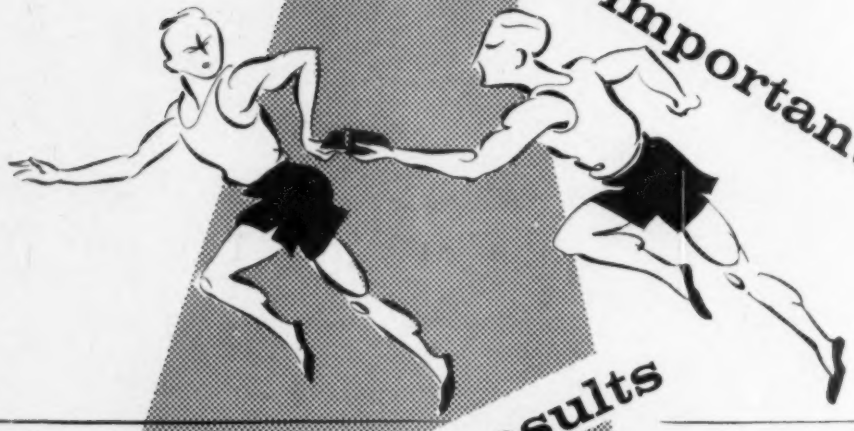

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This will show that sand is your most considerable item of waste. *Up to 85% core sand* can be saved with a plant which will pay for itself in a very short time.

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More and more foundries are switching to our plastic pattern letters. It's easy to see why: they're cheaper by half, they stand up to hammer blows, they come away clean and leave a perfect impression and you can fix them with nails or adhesive. Now we're making smaller sizes—⅜ in. right down to ⅛ in.—and we're giving them sharp faces to maintain the clear impression. (The larger sizes still have the standard flat face with all its special advantages). Let us send you a handful of assorted sizes and a price list—they'll tell you everything you want to know about plastic pattern letters—including why so many foundries use them.

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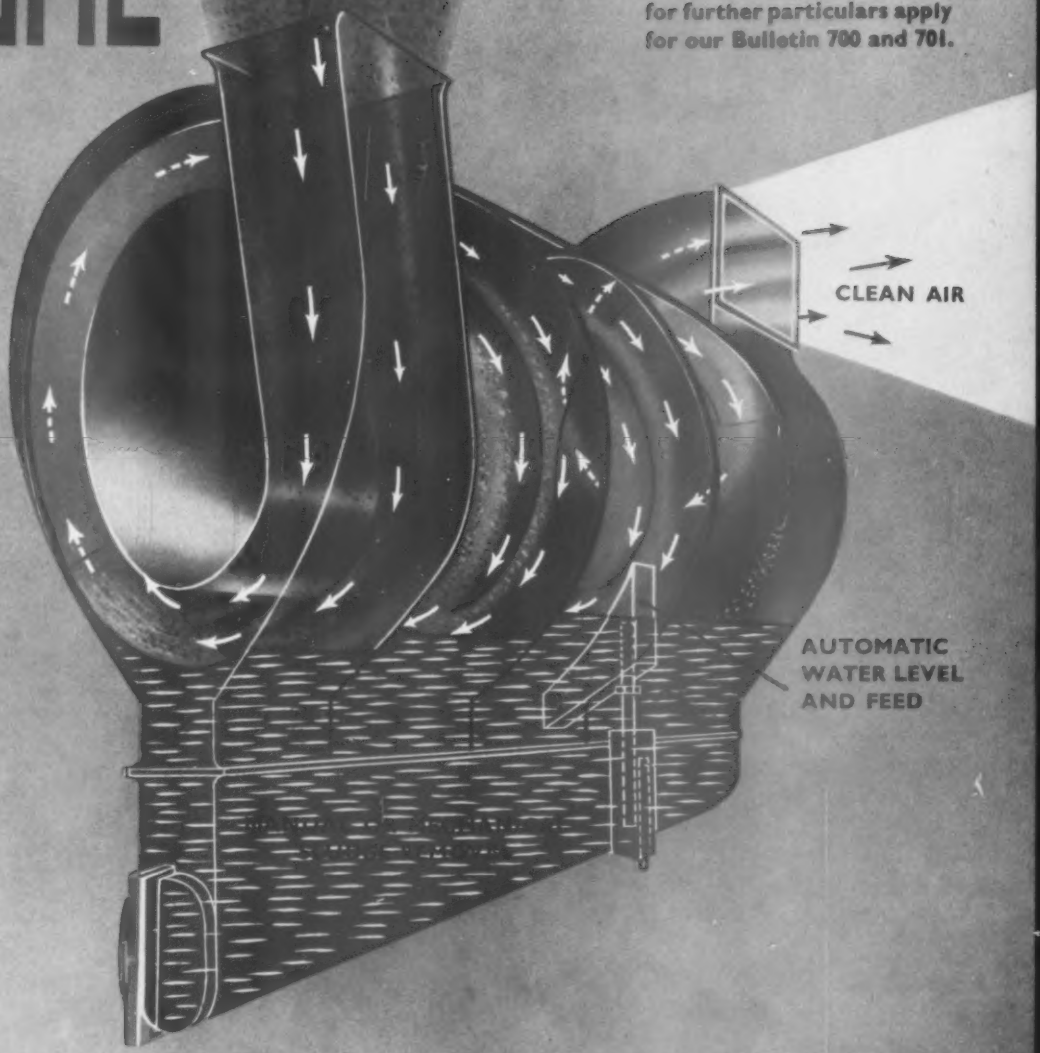

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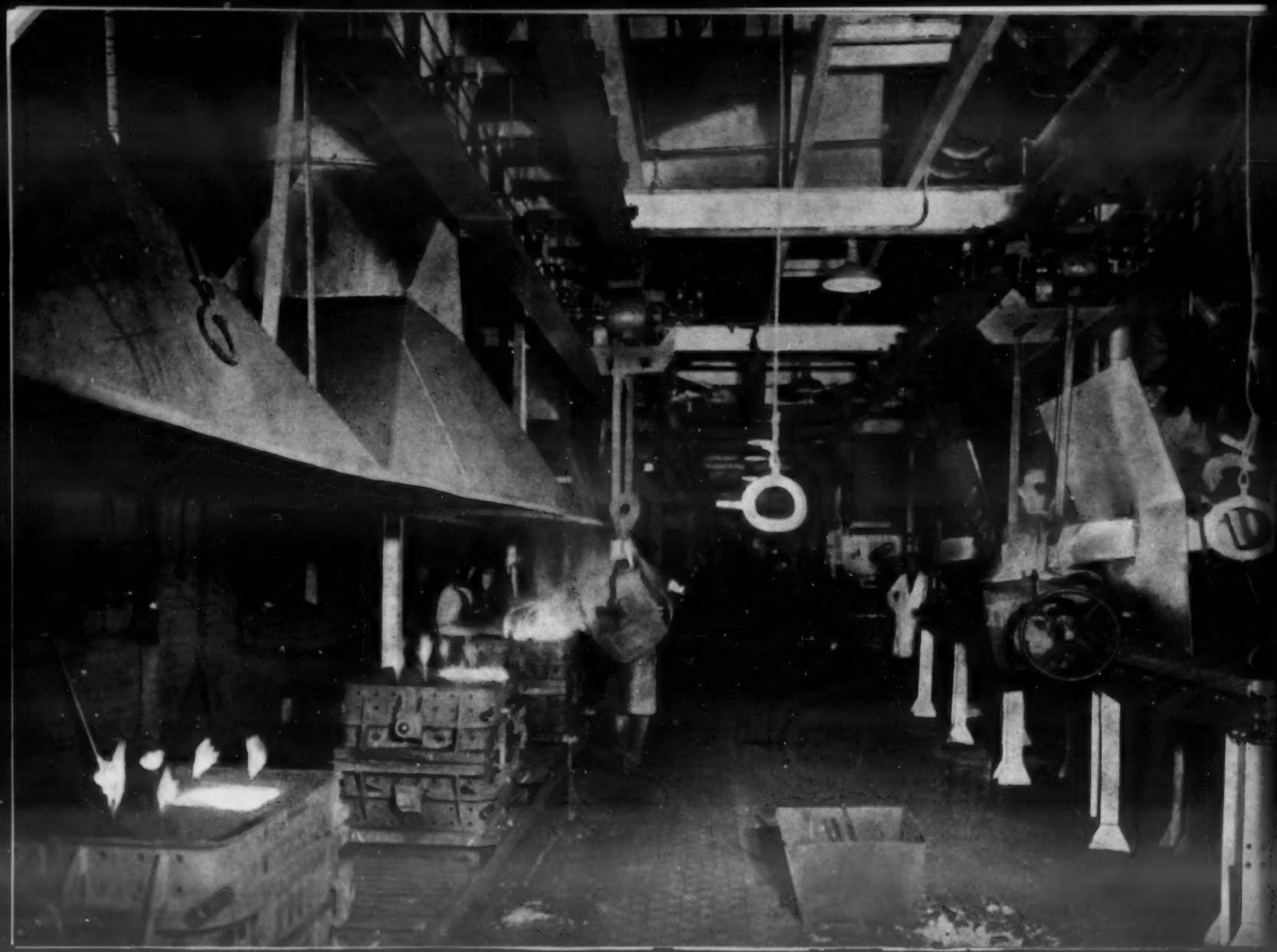
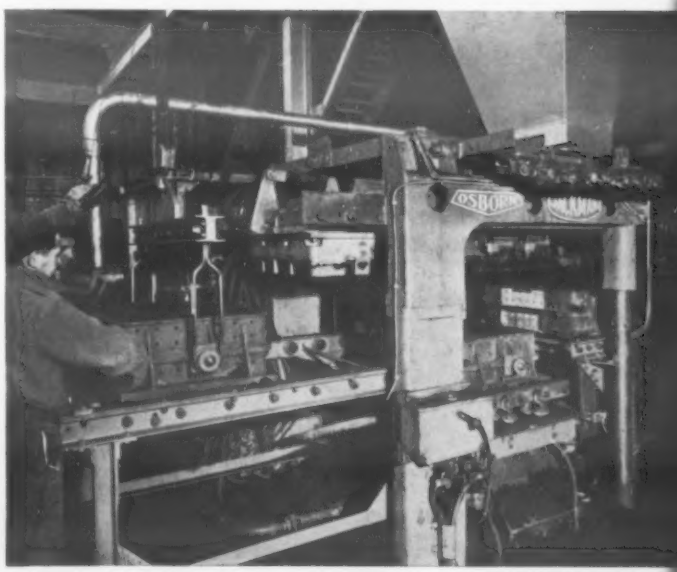
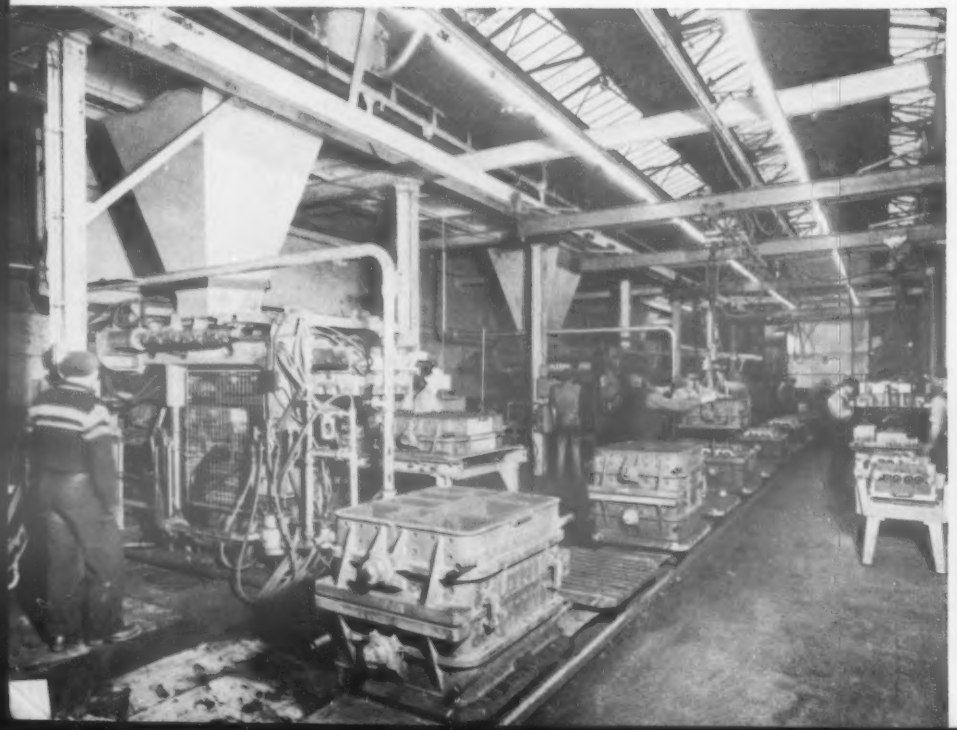


614 Cogent

Sterling boxes help to build BMC parts at Wellingborough

Sterling boxes are used in conjunction with these new semi-automatic machines recently installed at Messrs Morris Engines Foundry at Wellingborough. The machines are capable of an output of sixty complete moulds per hour, and the boxes used are of the famous Sterling heavy duty type designed to resist very high moulding pressures and stresses, and ideal for operating in mechanised foundries.





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MOULDING BOXES

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* **New design–rugged construction–fully automatic**
* **Push button control–fast, easy and efficient operation**
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* **Variable Blow position–time controlled Blow**
* **Adjustable Rocking during Cure–separate timers**
* **Unique Flip-Plate assembly "hands" core to operator–no contact with hot plates or boxes**

Accommodates core boxes up to:- 25" HEIGHT
20" WIDTH
14" DEPTH

Interchangeable heater plates up to:- 24" HEIGHT
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Electric heating—thermostat controlled

Designed for high speed production of medium/large shell cores—equivalent of up to 200 lbs solid weight

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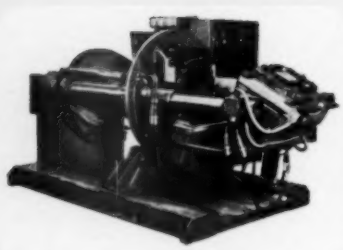

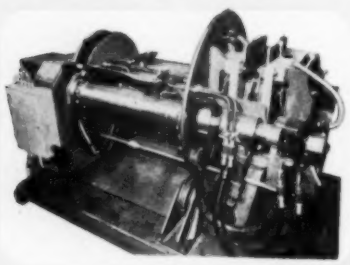

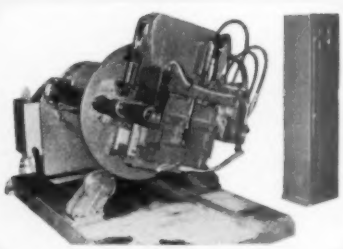

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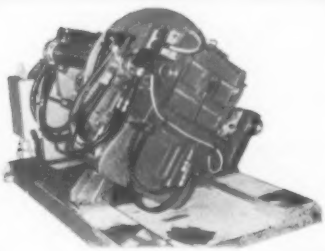
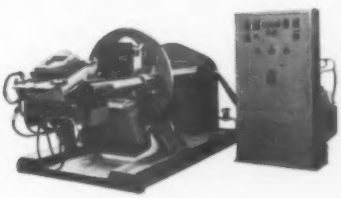
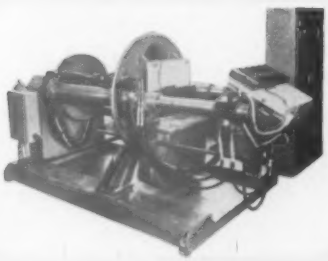
automatic shell core blower...

...for perfect shell cores







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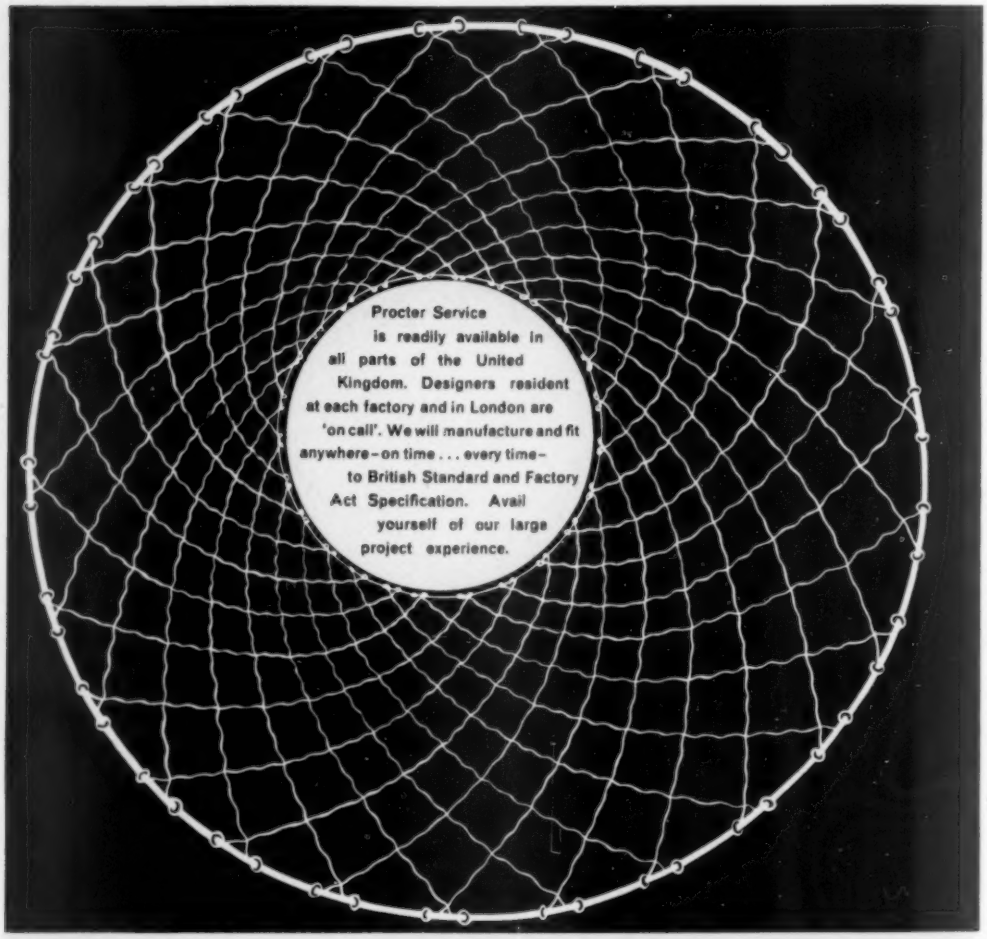
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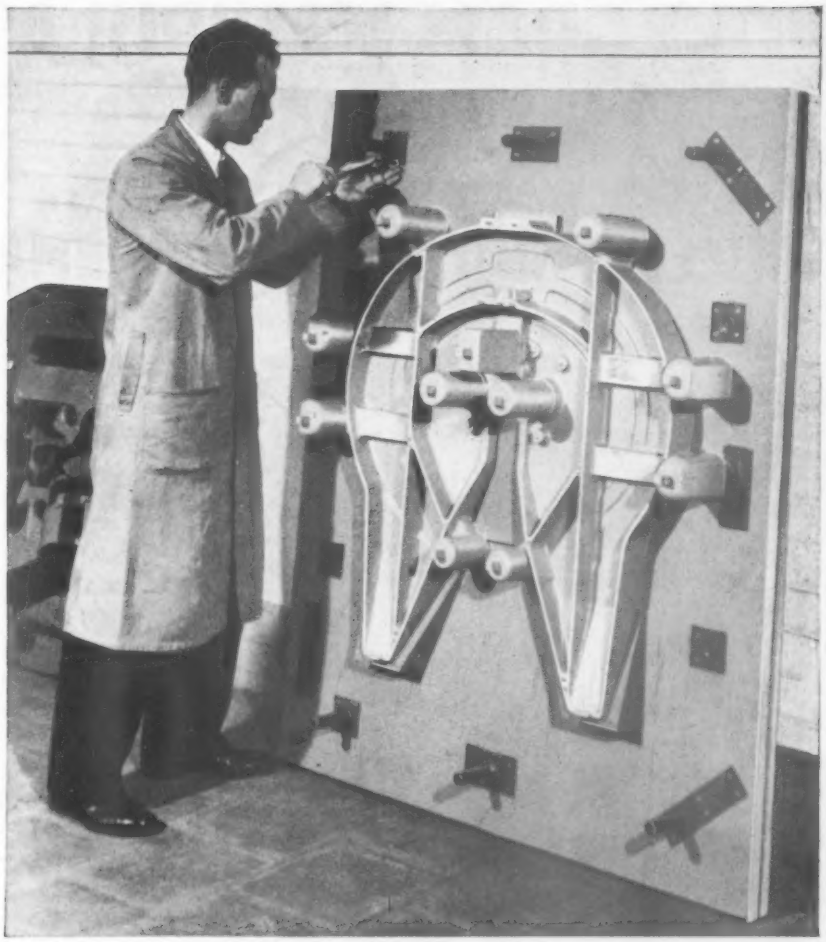

Standing up to it

This pattern for a fifth wheel steel casting required by Scammell Lorries Limited was made at the Leyland Motors Limited steel foundry at Farrington. It was made in Araldite casting resin because wood patterns could not withstand constant use on moulding machines. Araldite casting resins permit the speedy and economical production of any number of replica patterns, enabling the master pattern to be preserved. These duplicates are exact to size, as there is no shrinkage during setting, and no allowance for 'double reduction' is necessary. The patterns are tough, durable and not easily damaged, and do not deteriorate in store. Furthermore, modifications can easily be made, using the same materials. May we send you details of 'Araldite' epoxy resins for foundry patterns?

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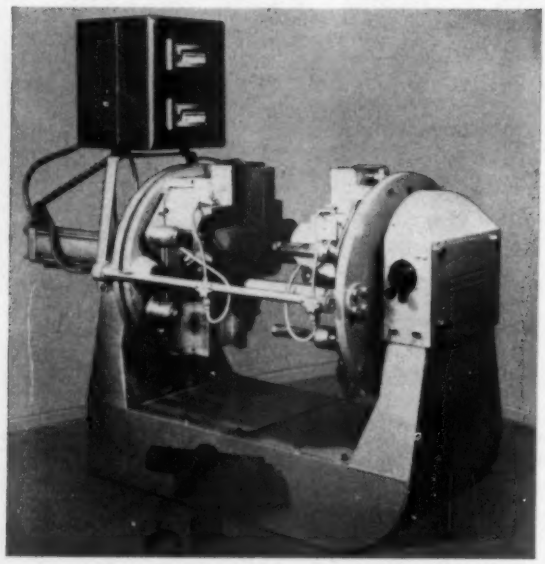
AP 651

POLYGRAM MANIPULATORS FOR SHELL MOULD AND COREMAKING



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Full pneumatic operation from closing box to ejection of core.

Automatic control of operation if desired.

Temperature of each half of corebox electrically regulated within $\pm 5^{\circ}$C.

Can be used with existing core blowers or shooters.

These Manipulators can be incorporated into a number of multi-station Mould and Coremaking Plants.

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of surpassing perfection... and finding new heights to scale because perfection to a perfectionist doesn't exist it is merely comparative excellence—awaiting improvement.
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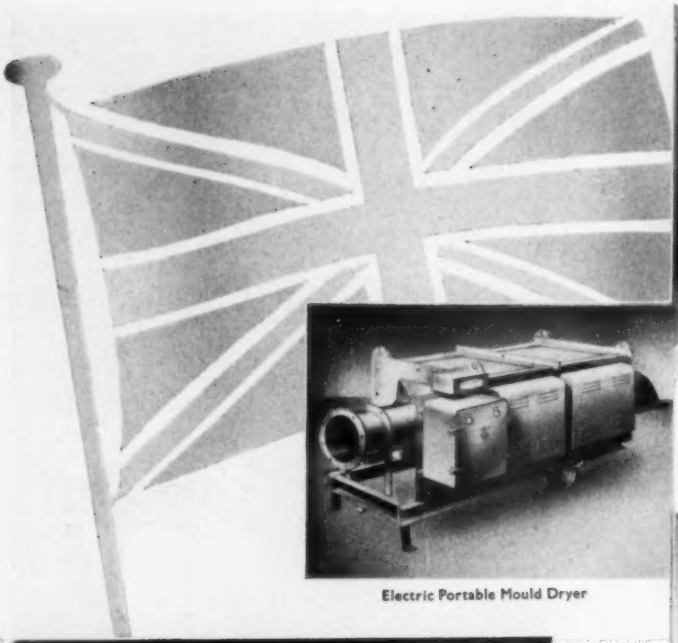

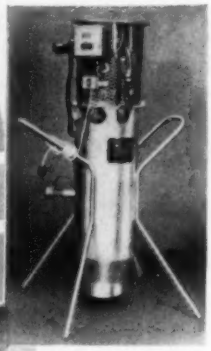

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'NEWSTAD'

PORTABLE MOULD DRYERS

—for Economy
—Efficiency
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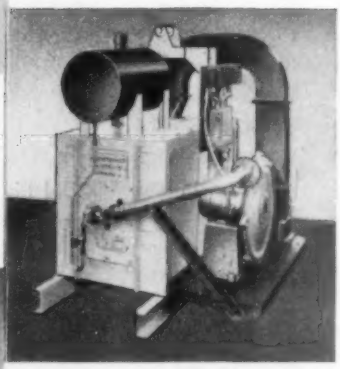
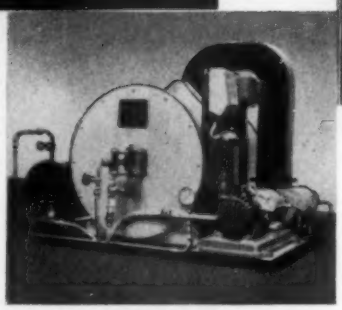


"Newstad" Oil Fired



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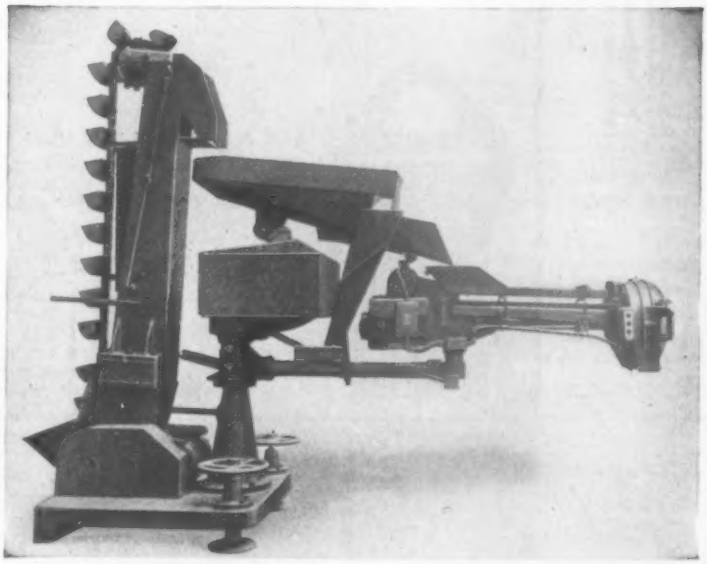

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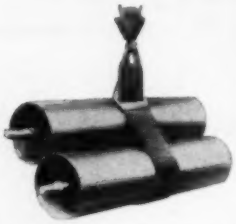

THE SLING WITH 1,000 USES

The " Wedco " wire Belt Sling has the strength of steel combined with maximum flexibility and a wide bearing surface giving exceptional load stability.
Made from thousands of strands of sturdy woven wire in a smooth transverse loop construction " Wedco " Wire Belt Slings cannot snap or tear. They are safer, easier to handle, faster to rig and will not whip, kink or tangle.
In the field of mechanical handling this is something you should know more about, write us for the fullest details.

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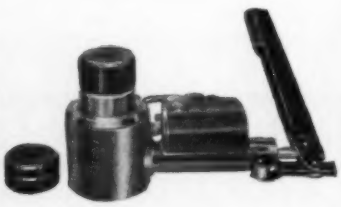
Incorporating a patented Overload Preventer giving greater security and safety to the operator, also reducing wear and saving cost of maintenance. A free - wheeling feature enables quick adjustment of unloaded chains

BABY 60 ELECTRIC HOIST BLOCKS

BRITISH MADE. Patents Pending. 5 and 10 cwt. capacity. Light weight, compact and portable. Pushbutton control. Upper and lower overtravel limit switches. Supplies for any height of lift to suit requirements. Top hook suspension facilities attachment to travelling trolleys or girder clamps, etc.

LOW LIFT JACKS

Large capacity for use in confined spaces. Swaying under load eliminated by large diameter providing easy adjustment of height. Capacities from 10 to 30 tons.



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Blocks built-in to Travelling Trolleys, giving reduced head - room. Capacities from 1 ton to 20 tons.

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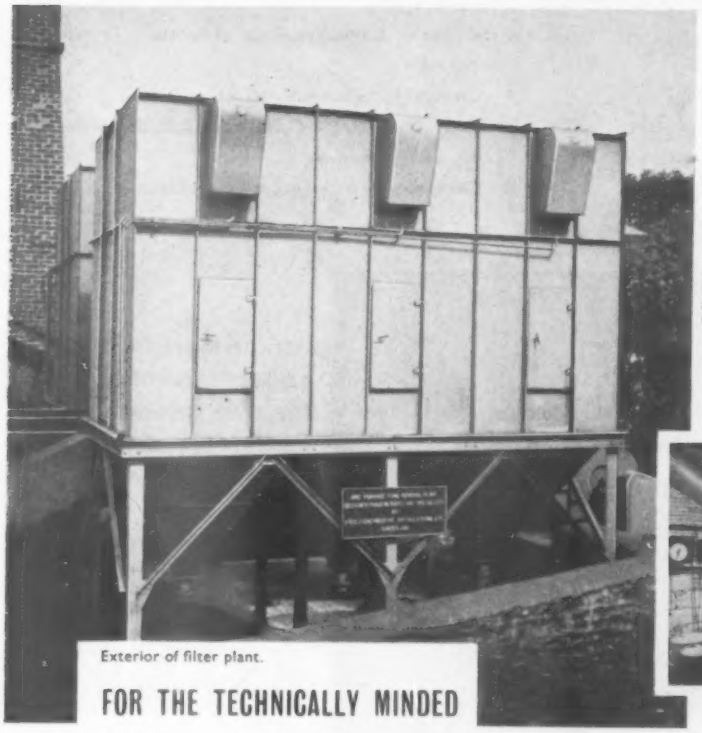
Phone : KENSINGTON 7401 (4 lines) *TELEX 24118.* *'Grams: 'FELCOHOIST,' LONDON, TELEX*

99·66% EFFICIENCY!



Exterior of filter plant.

Yes, the difference between absolute perfection and the collecting efficiency of Steels Fume Extraction Equipment is·34%! And this is no arbitrary figure—it results from rigorous testing by a **completely independent authority.** Yet, **STEELS ENGINEERING INSTALLATIONS LIMITED**—specialists in every aspect of industrial dust control, and makers of the internationally famous SPA dust collector—supply their equipment at an extremely competitive cost, erect it without the least hindrance to production.

Furnace hood showing extraction ducting.

FOR THE TECHNICALLY MINDED

The collector on which this completely impartial test was carried out serves a 3 ton electric arc furnace. It is of rectangular construction, 22' 0" by 17' 6" by 19' 0" high, and comprises two sets of three automatic fabric filters. The filtering media are of 'Orlon' fabric forming a total area of 6,800 square feet. The nominal exhaust rate of the installation is 12,000 C.F.M., obtained by a high efficiency backward aerofoil centrifugal fan powered by a 35 h.p. motor.

Cleaning is automatically carried out by isolating each filter in turn and shaking the fabric. The frequency and duration of shaking are adjustable, and the exhaust rate is maintained throughout the cleaning operation.

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OF THE GAS
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DIVISION OF

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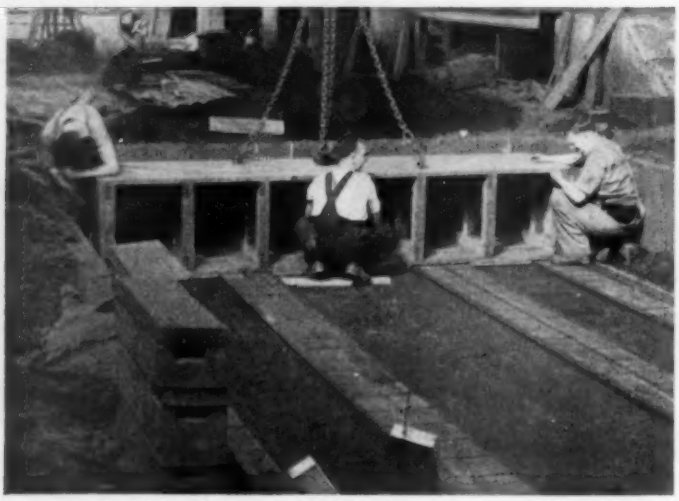
SUNDERLAND & BIRMINGHAM

887

Better Casting Quality

For the production of high grade castings CARBOFRAX * Denseners and Densening materials are second to none.
Used in place of metal chills, their inclusion in the mould ensures that castings have a combination of properties which cannot be obtained by other methods.

- **Trouble-free machining is ensured–no hard spots.**
- **A more homogeneous structure is produced.**
- **Complete absence of blow-holes.**
- **Easy stripping—CARBOFRAX denseners do not " burn-on "**
- **Castings are more wear-resistant.**



CARBOFRAX denseners in the mould of a large machine tool casting. (*Courtesy of Modern Foundries Ltd., Halifax*)

CARBOFRAX Denseners can be used with equal success on iron, steel, bronze and aluminium castings.

Write to us for details.

* *Regd. Trade Mark*

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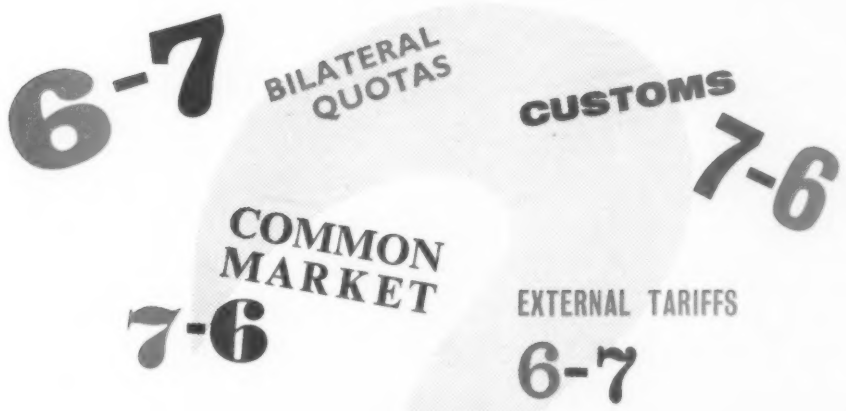
Telephone RAINFORD 571

WHATEVER THE ULTIMATE OUTCOME



Politicians may be at sixes and sevens deciding the economic fate of Europe, but it is common knowledge among discerning Foundrymen that their prosperity, as always, is governed by the ability to produce high class goods at competitive prices.

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THE FOXBORO AIR WEIGHT CONTROL SYSTEM is specially developed to provide the Foundry Industry with Uniform Cupola Control. This completely Automatic System controls the weight of Air delivered to the Cupola, reduces fuel consumption and makes possible :—

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HIGHER QUALITY CASTINGS

In addition, Foxboro Systems are available for measuring, recording or controlling — Pressure, Humidity, Dewpoint, Temperature and many other variables.

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REDHILL • SURREY • ENGLAND

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Solve the Problem

This company produces a diversity of castings in alloy iron and hematite iron. These include ingot moulds for the steel industry, brake drums and liners for Public Passenger vehicles, machine tool castings, gear wheel blanks, Colliery castings and General Engineering castings. The problem here was to find a suitable Shot Blast Machine to clean castings from one pound to two tons at lowest total cost and to speed production.

for **ALLOY STEEL & IRON CO · CHESTERFIELD & SHEFFIELD**

THE SOLUTION . . .

After seeing the Pangborn LK 6ft. Rotablast at the 1958 Foundry Exhibition they decided to instal this machine to replace an Airless Rotary Barrel which was limited to size and weight of castings it was able to clean.

THE RESULTS . . .

1 Machine easily installed.

2 No Foundations required.

3 All Castings produced are now cleaned by machine.

4 50 per cent. increase in Output is now cleaned by same number of operatives.

5 No Breakages of Thin Castings.

6 Considerable saving of shot.

7 Fettling keeps pace with output.

Perfectly clean Castings to customers on time.

Blasting time three minutes

HEPBURN CONVEYOR Co. Ltd.

Telegrams: CONVEYORS
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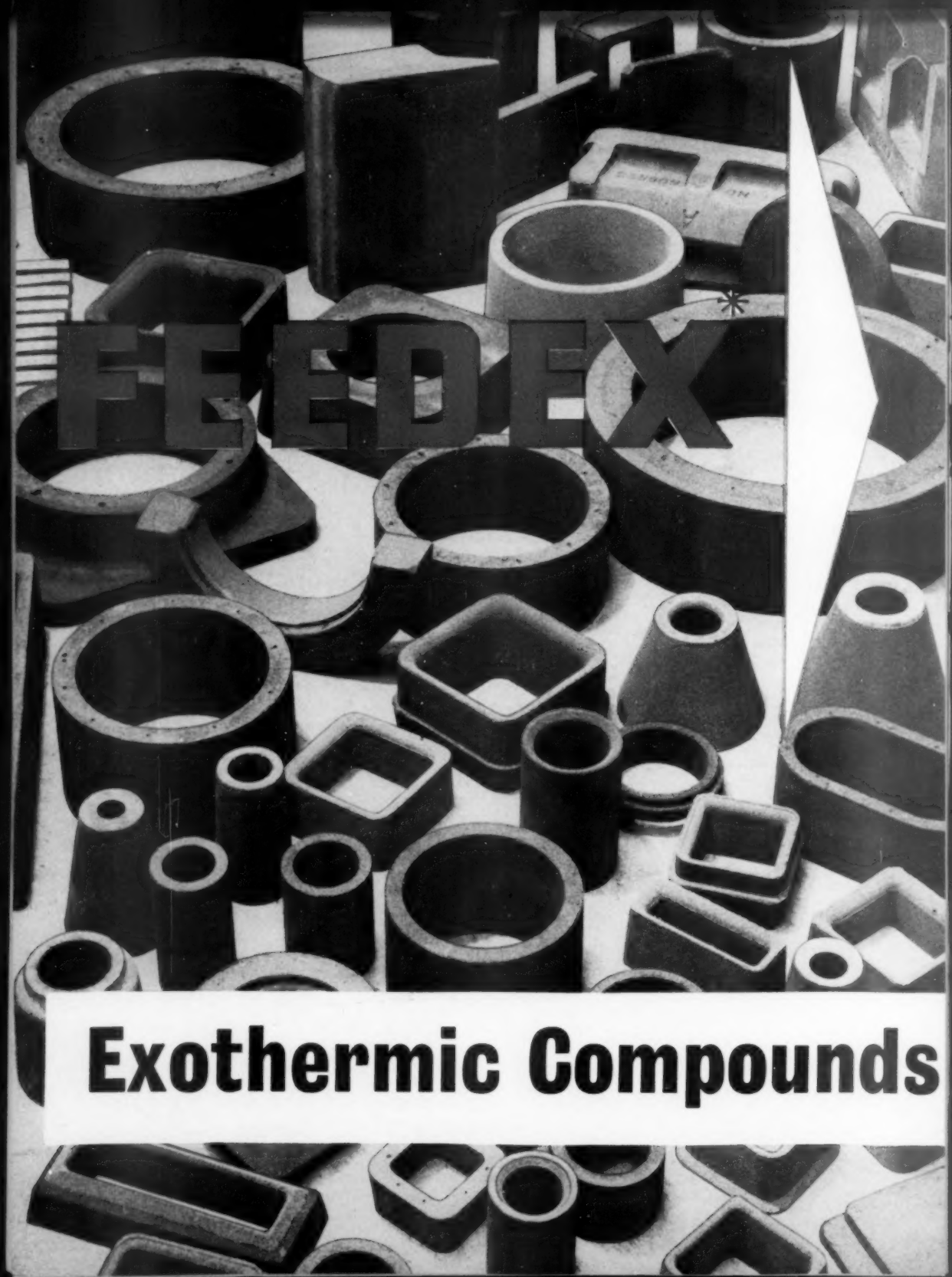
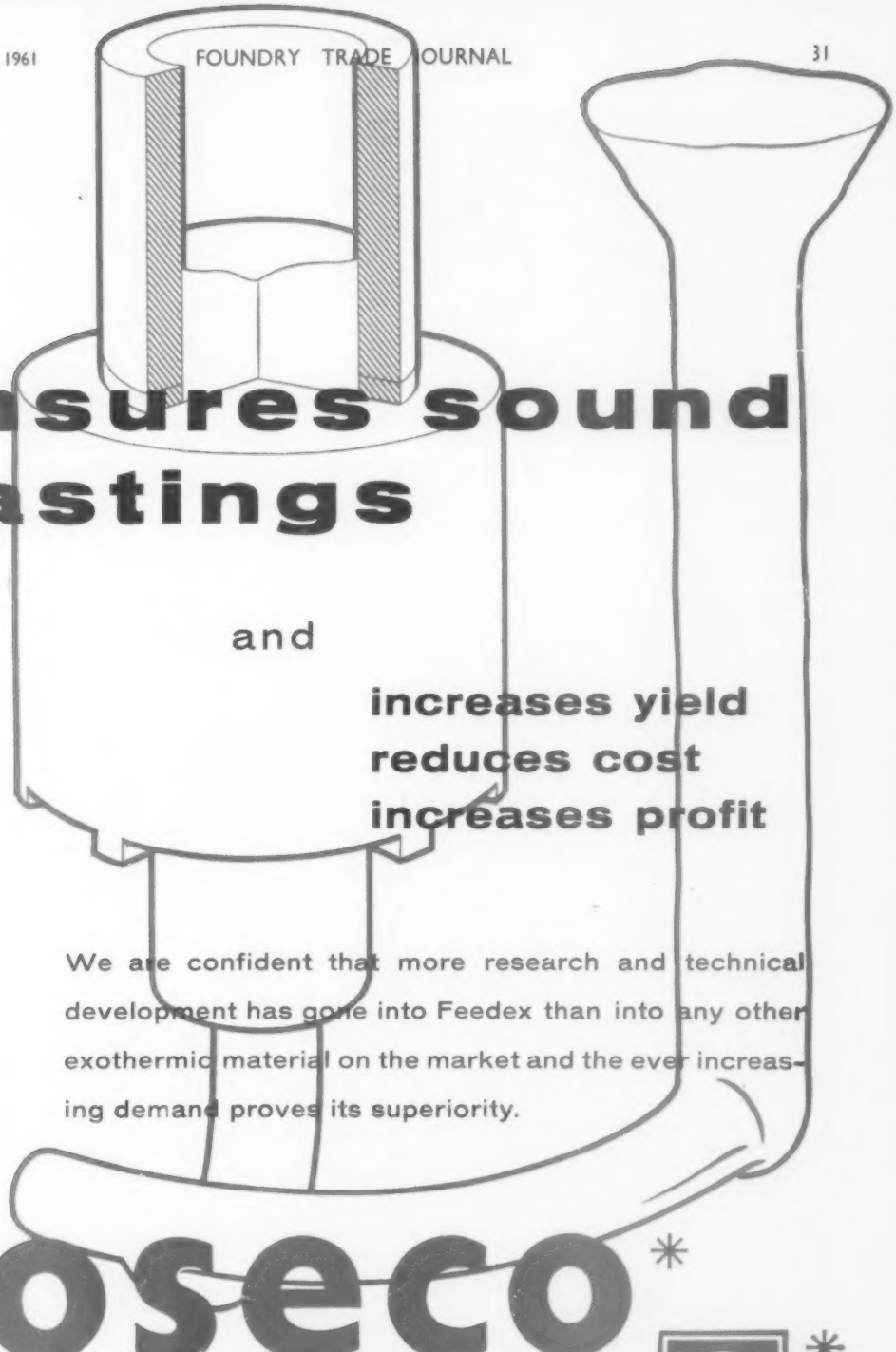


Exothermic Compounds



ensures sound castings

and

increases yield
reduces cost
increases profit

We are confident that more research and technical development has gone into Feedex than into any other exothermic material on the market and the ever increasing demand proves its superiority.

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MEMO

TO THE FOUNDRY MANAGER

VEW have more than 120 Hot Blast Cupola Plants in operation both at home and abroad. The range of melting rates is from 1 ton per hour to 35 tons per hour, either directly fired or recuperative systems, and can be supplied as either steel tube or cast iron tube recuperators.

Suggest we ask for literature and a visit from their technical staff. Their address is:

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R.J.H.

P.S. Their new direct oil fired unit appears to be attracting attention.

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LOADED EASILY WITH

CENTRIBLAST

AIRLESS ROOM PLANT

SPENCER AND HALSTEAD LIMITED. BLAST CLEANING DIVISION OSSETT YORKSHIRE

Castings are quickly cleaned, loaded and unloaded in this Airless Blast Cleaning Room with floor mounted turntable and power traversed Bogie. It's just one of many Centriblast Rooms—all designed to satisfy customers' individual requirements. If YOU clean large or small castings, there's a Centriblast Room to do the job faster . . . more thoroughly. Call us in for a consultation.

12' x 12' x 9' 6" high Airless Blast Cleaning Room with 10' diameter 10 ton capacity Floor Level Turntable and Rigid Screen Dust Arrester. Photographs by courtesy of Messrs. Lloyds-Burton.

STANTON AND STAVELEY low phosphorus foundry pig iron

This iron is machine cast and customers special requirements can be met within the limits of analysis shown.

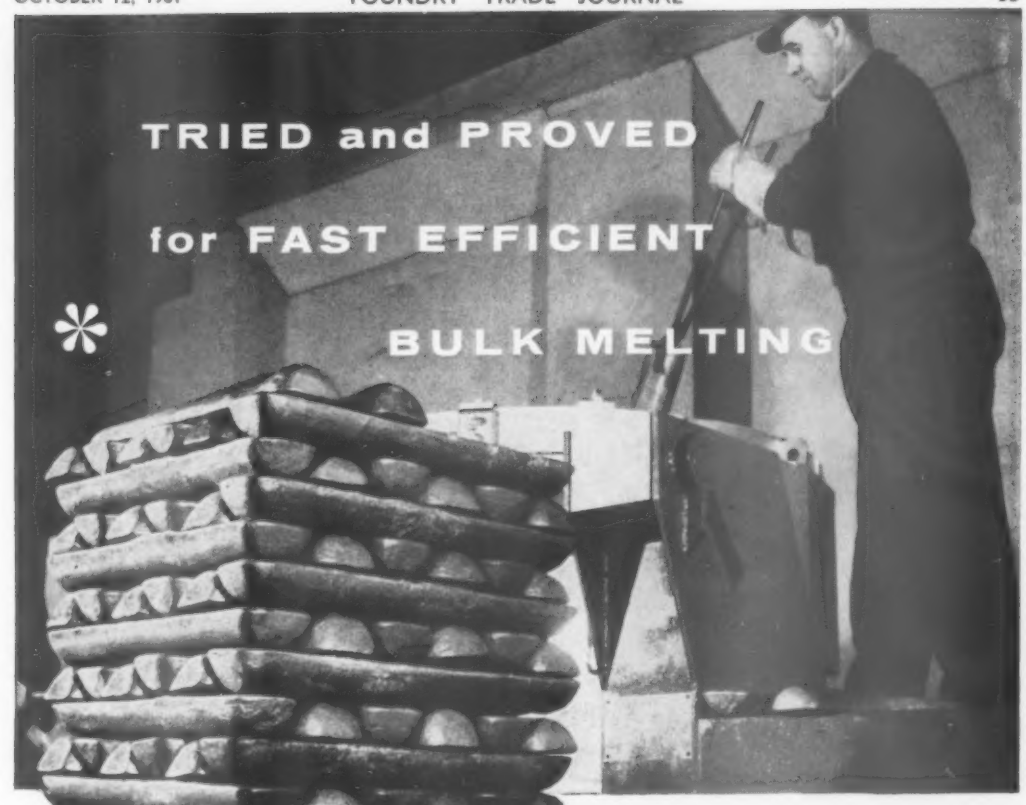
It is particularly suitable for the Automobile Industry and for all High Quality Castings.

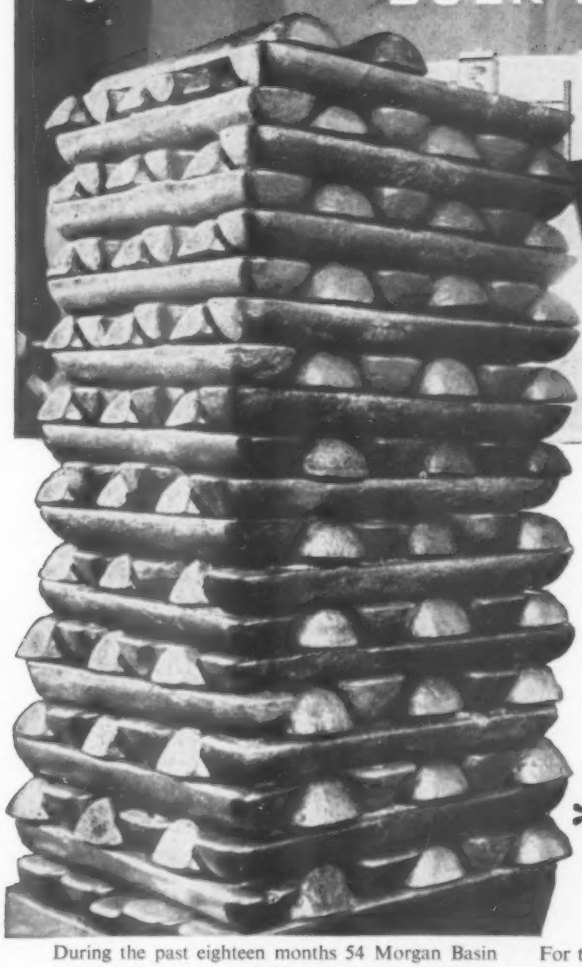
ANALYSIS		
	Total Carbon	3·4% min.
	Silicon	2·0—4·5% (in ranges of ·5%)
	Manganese	0·7—1·1%
	Sulphur	0·05% max.
	Phosphorus	0.25 % max.

TELEPHONE: ILKESTON 2121

A free and confidential metallurgical service is offered to customers in all aspects of foundry practice and technique.

STANTON AND STAVELEY SALES LIMITED NEAR NOTTINGHAM





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*The new BT-1300 takes only 60 minutes to melt all this Aluminium Alloy

During the past eighteen months 54 Morgan Basin Tilters have been installed in modern foundries for fast and economical bulk melting of a wide range of high quality aluminium or copper based alloys.

For top quality castings and lowest melting loss, invest in the most flexible of all bulk melters. Ask for a demonstration, with your own metal if preferred, at the Battersea Test Foundry.

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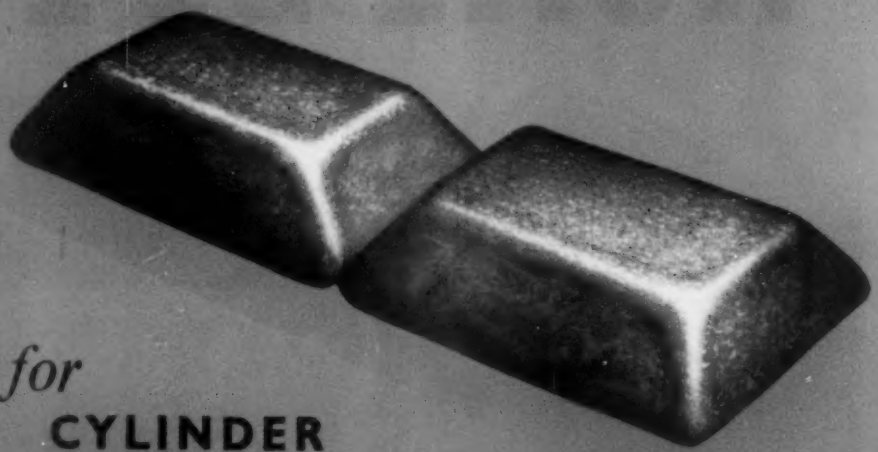

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CYLINDER AND HIGH DUTY CASTINGS

The perfect pig-iron for cylinder and high duty castings . . . free from porosity and of high tensile strength. Our Technical Staff is always ready to assist users and to advise with regard to mixtures. We cordially welcome your enquiries.

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3 MECHANICAL SLUDGE EJECTION

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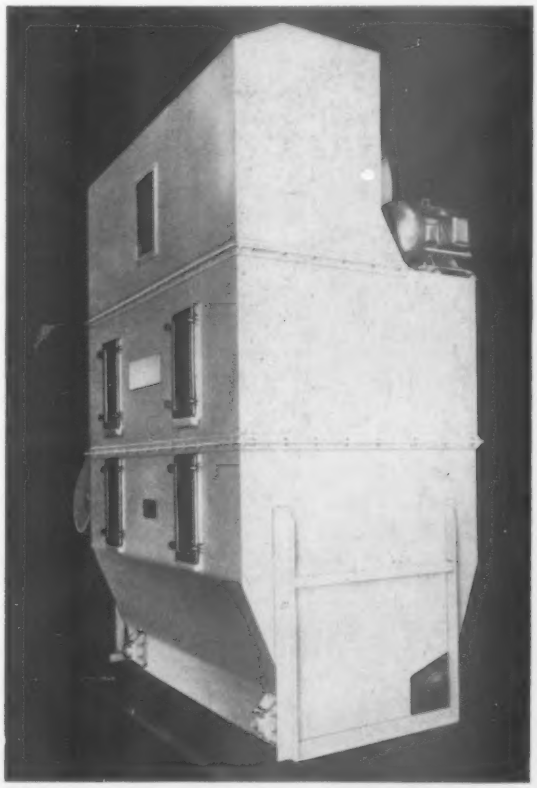

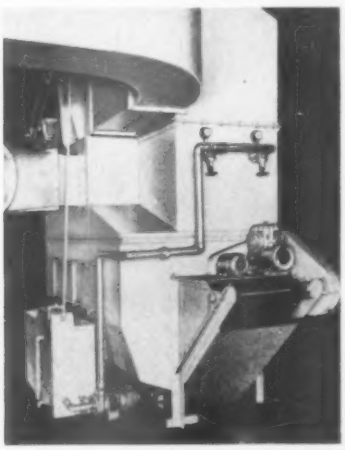

Our Engineers will be pleased to discuss the economic and operational advantages of this new Separator. Please write for details.

Photographs by courtesy of Foundry Equipment Ltd.

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produce ~~120~~ every hour

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- ✓All pneumatic, no electronics.
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- ✓Foolproof automatic controller can be varied to suit any required speed or sequence.
- ✓Shockless jolt, nothing below ground.

Write now for details of these outstandingly successful machines or visit our works for a demonstration.

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One of the BQ Automatic Machines in the "DARCAST" Foundry at West Bromwich.

Empty box rolls in on gravity conveyor. Mould emerges on flanged rollers to clear "cods" or ram-up cores.

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wide range of permeabilities and strengths to suit any foundry requirement—produced under laboratory control, technical assistance given on any sand control problem.

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ORGANISATION OF THE UK FOUNDRY INDUSTRY

The foundry industry of the United Kingdom is represented by the following organisations, many of whose proceedings are regularly reported in this JOURNAL:—

Ironfounding Employers' Associations

COUNCIL OF IRONFOUNDRY ASSOCIATIONS

Chairman: **M. J. Glenny.** *Director:* **Kenneth Marshall.** *Ass. Director:* **J. W. Butler.** *Secretary:* **D. L. Farrant,** 14, Pall Mall, London, S.W.1. 'Phone: WHitehall 7171. *Participating Associations:* British Cast Iron Research Association (affiliated); Institute of British Foundrymen (affiliated), and the following:—**Association of Automobile and Allied High-duty Ironfounders.** Secretaries, Heathcote and Coleman, 69, Harborne Road, Edgbaston, Birmingham, 15. 'Phone: Edgbaston 4141. 'Grams: "Clarify," Birmingham, 15. **British Ironfounders' Association and British Bath Manufacturers' Association.** Director and Secretary: J. Galbraith Sneddon, C.A., 145, St. Vincent Street, Glasgow, C.2. 'Phone: Central 2891. 'Grams: "Groundwork," Glasgow. **British Grit Association** (affiliated).—Secretary: J. Campbell MacGregor, 10, Bank Street, Airdrie, Lanarkshire. **British Malleable Tube Fittings Association.**—Secretary: F. B. Ridgwell, 196, Shaftesbury Avenue, London, W.C.2. 'Phone: TEMple Bar 6052-3. 'Grams: "Brimatufia," London. **Cast-Iron Chair Association.**—Secretaries: Peat, Marwick, Mitchell & Co., The Cast Iron Chair Association, Queen's Square, Middlesbrough, Yorkshire. **Cast Iron Heating Boiler and Radiator Manufacturers' Association.**—Secretary: J. R. Aldam, 69, Cannon Street, London, E.C.4. 'Phone: CITy 4444. **British Cast Iron Pressure Pipe Association.**—Secretary: W. I. Campbell, 14, Pall Mall, London, S.W.1. 'Phone: WHitehall 7941. **Cast Iron Segment Association.**—Secretary: W. Rose, Stanton Ironworks Company, Limited, P.O. Box 3, near Nottingham. **National Association of Malleable Ironfounders.**—Secretary: E. N. Turner, Chamber of Commerce Offices, Tudor House, Bridge Street, Walsall. 'Phone: Walsall 5671. **National and Midland Ironfounders' Association.**—Secretary: F. W. Sims, 69, Harborne Road, Edgbaston, Birmingham, 15. **National Ingot Mould Association.**—Secretaries: Peat, Marwick, Mitchell & Company, 301, Glossop Road, Sheffield. 'Phone and 'Grams: Broomhill 63031. **Roll Makers Association of Great Britain.**—Secretaries: Peat, Marwick, Mitchell & Company, Beaufort House, Newhall Street, Birmingham, 3. 'Phone: Central 6661-3.

NATIONAL FEDERATION OF ENGINEERING & GENERAL IRONFOUNDERS

Chairman: **E. Kenneth Gould,** Goulds Foundries, Limited, Newport, Mon. *Secretaries:* **Mann, Judd & Co.,** 8, Fredericks Place, London, E.C.2. **Constituent Associations:** Ironfounders' National Confederation and National Ironfounding Employers' Federation.

IRONFOUNDERS' NATIONAL CONFEDERATION

Chairman: **R. A. S. Lomax,** Ashwell & Nesbit, Limited, Barkby Road, Leicester. *Secretaries:* **H. Overton, Salt & Company,** 12th Floor, City Centre House, 30, Union Street, Birmingham, 2. 'Phone: Midland 8427. **Branch Associations:** *East and West Ridings.*—Secretary: C. L. Carver, Ellerby Foundry, Ltd., Ellerby Lane, Leeds, 9. 'Phone, Leeds 31538. *London, Home and Eastern Counties and Midlands.*—Secretary: D. Swain, H. Overton, Salt & Company, 30, Union Street, Birmingham, 2. *North Midlands:*—Secretary: F. Summers, Ashwell & Nesbit, Limited, Barkby Road, Leicester. 'Phone: Leicester 67151 *North Western.*—Secretary: D. Swain, H. Overton, Salt & Company, 30, Union Street, Birmingham.

NATIONAL IRONFOUNDING EMPLOYERS' FEDERATION

President: **E. Kenneth Gould,** Saunders Valve Co., Ltd., Grange Road, Cwmbran (Mon.). *Secretaries:* **Mann, Judd & Co.,** 8, Fredericks Place, Old Jewry, London, E.C.2. 'Phone: METropolitan 8613. 'Grams: "Manjudca Phone," London. **Branch Associations:** *Leeds and District Ironfounders' Association.*—Secretary, F. H. Foster, H. J. Gill & Co. (Leeds), Ltd., 194, Cardigan Road, Leeds, 6. 'Phone: 52020. *Leicester and District Ironfounders' Employers' Association.*—Secretary: C. S. Bishop, 8, New Street, Leicester. 'Phone: Leicester 58842. *Liverpool and District Ironfounders' Association.*—Secretary: J. S. Hassal, 16/18, Hackins Hey, Liverpool, 2. 'Phone: Central 10114. *Manchester and District Ironfounders' Employers' Association.*—Secretaries: Webb, Hanson, Bullivant & Co., 90, Deansgate, Manchester. 'Phone: Blackfriars 8367. 'Grams: "Sound," Manchester. *Monmouthshire Founders' Association (incorporating Cardiff and District Founders' Association).*—Secretary: I. J. Smith, Tredegar Foundry, Newport, Mon. 'Phone: Newport 66771. 'Grams: "Rogerwinch," Newport. *North of England Ironfounders' Association.*—Secretaries: Mann, Judd, Gordon & Co., 61, Westgate Road, Newcastle-upon-Tyne. 'Phone: Newcastle 20836. 'Grams: "Mannca," Newcastle. *North Staffordshire Ironfounders' Association.*—Secretary: I. H. L. Beech, Bourner, Bullock & Co., Federation House, Station Road, Stoke-on-Trent. 'Phone: Stoke-on-Trent 44245. *Scottish Ironfounders' Association.*—Secretaries: Mann, Judd, Gordon & Co., 142, St. Vincent Street, Glasgow, C.2. 'Phone: Central 2857. 'Grams: "Mannca," Glasgow. *Sheffield and District Ironfounders' Association.*—Secretary: Frank Hepworth, 59, Clarkehouse Road, Sheffield, 10. 'Phone: Sheffield 60047. 'Grams: "Emploledra," Sheffield. *South of England Ironfounders' Association.*—Secretaries: Mann, Judd & Co., 8, Fredericks Place, Old Jewry, London, E.C.2. 'Phone: METropolitan 8613. 'Grams: "Manjudca Phone," London. *Welsh Engineers and Founders' Association.*—Secretary: W. D. M. Davis, 1, St. James Gardens, Swansea. 'Phone: Swansea 59166. 'Grams: "Iron" Swansea. *West of England Ironfounders' Association.*—Secretaries: Mann, Judd & Co., 8, Fredericks Place, Old Jewry, London, E.C.2. 'Phone: METropolitan 8613. 'Grams: "Manjudca Phone," London. *West Riding Ironfounders' Association.*—Secretaries: Charles D. Buckle & Co., 55 Sunbridge Road, Bradford, 1. 'Phone: Bradford 25346.

Other Employers' Associations:

BRITISH STEEL FOUNDERS' ASSOCIATION

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Technical:

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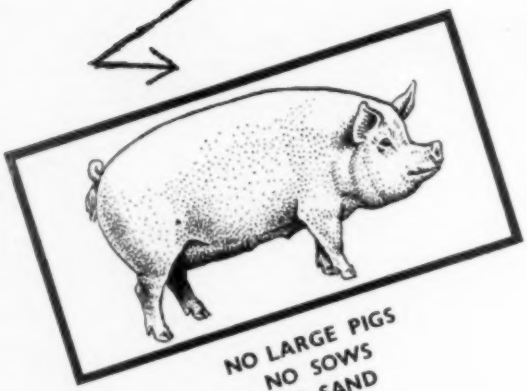

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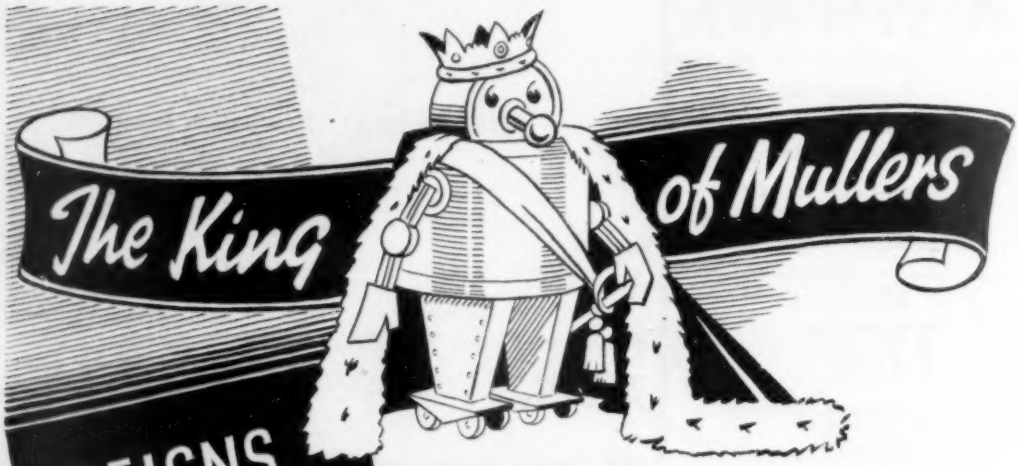

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Vol. 111 October 12, 1961 No. 2340

Industrial Health

The Annual Report of the Chief Inspector of Factories on Industrial Health* refers particularly to hazards resulting from the use of the newer metals, for example, the increasing use of copper-base beryllium alloys, and advice has been given by the inspectors because five cases of poisoning with this metal were reported in 1960. Three were concerned with 2 per cent. beryllium/copper alloys and two showed delayed effects of exposure to beryllium compounds formerly used as phosphors in the manufacture of fluorescent lamps. In the foundry, an environmental survey undertaken after two cases revealed levels of beryllium in excess of the accepted maximum permissible concentration during the processes of slagging, pouring and manipulating the melt. When, however, beryllium is used as a hardening and corrosion-resistant ingredient for aluminium alloys, where only 0·005 per cent. is used, it does not appear likely that the permissible content will be exceeded in practice.

After an interval of ten years, a case of lead poisoning has been reported from the vitreous-enamelling industry. This situation represents a great improvement on 1910, when there were 17 cases. Another industrial disease from which the foundry is clear nowadays is anthrax. At one time, quantities of straw rope came from the Continent and quite frequently cases of the disease were reported, until an embargo was placed on imports. The notification of dermatitis is not compulsory, but despite this, the Inspectorate received news of 1,671 cases. The number of industrial processes which can give rise to this ailment is quite large, but usually can be associated with the use of organic compounds.

Pneumoconiosis—which includes silicosis because of its delayed appearance—is difficult to assign to any particular year. In 1956 in England and Scotland, the death certificates of 90 foundry workers attributed the cause to this disease, whereas in 1960, the figure rose to 114. However, it will take several years more to ascertain the full effects of the Foundry Regulations on the health of employees. The medical history of entrants to the industry should be carefully noted as no doubt some of the cases now coming to light had their origin in the coal mines. Finally, it is germane to note that on January 1 this year, an order came in force that all factory walls and ceilings should be coated with a suitable paint, so as to produce a complete continuous film capable of being washed. New first-aid regulations came into force on July 1 this year, requiring the employment of a properly-trained person in all factories employing more than 50 persons.

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French Foundrymen's Technical Association

Golden Jubilee Celebration

The *Association Technique de Fonderie* (the French Foundrymen's Technical Association) is celebrating the 50th anniversary of its foundation on November 13 and 14 next at its headquarters at 2, rue de Bassano, Paris 16. The opening meeting will be at 9 a.m. on the Monday morning, during which Mr. J. Lainé, principal of the French national foundry college, is to give an address. This is to be followed by a lecture by Mr. M. Dudouet on the training of foundry executives, particularly in relation to their duties in connection with accident prevention. The final lecture on "Technical Control in Foundries" is to be given jointly by Mr. P. Lapadu-Hargues (of the *Centre Technique*) and Mr. J. Leger (of the Peugeot concern).

In the afternoon, commencing at 3 p.m., two simultaneous technical sessions are to be held. In the *Nouvelle Salle*, the following papers are to be given:—"Design of Running Systems for Sand Moulds," by Mr. M. Jeancolas, Mr. G. Cohen and Mr. H. Hanf; "Studies of Fractures of S.-g Iron Castings," by Mr. R. El Haik; "Rôle of Graphite in Grey Iron Under Various Tensile Stresses," by Mrs. E. Plenard (*Centre Technique*), and "Thermal-shock Testing of Iron," by Mr. J. C. Margerie, Mr. J. Coppolani and Mr. M. Decrop (of *Centre Technique*). At the technical session to be held in the *Salle du Conseil* the following contributions are to be given:—"Refining of Aluminium/Silicon/Copper Alloys," by Mr. L. Grand (of the Metallurgical Research Centre, Chambéry); "Oxidizing Slags in Connection with Copper-base Alloys," by Mr. P. J. Le Thomas, Mr. D. Arnaud, and Miss Lethuillier (*Centre Technique*); "Nature and Influence of Factors influencing the Properties and Mechanical Strength of Tin-bronze," by Mr. R. Loiseau, Mr. G. Lemoine and Mr. P. Picard (of *Le Bronze Industriel* Society); "Properties of 'Zamak 3' Alloy using Pressure-cast Test-pieces," by Mr. G. Ulmer, Mr. M. Billing and Mr. M. Barthelet (of *Centre Technique*).

On the Monday evening, the Congress banquet will be held in the restaurant of the Pavillon Dauphine, which is situated in the Bois de Boulogne.

Tuesday's Programme

On Tuesday morning, two further simultaneous technical sessions are to be held when the following papers will be presented:—"I.R.S.I.D. process T.W.A. of Desulphurization as applied to Ingot-mould Making," by Mr. J. Raguin, Mr. J. Duflot and Miss J. Petitfrere (of the Research Institute for Sidérurgie); "Synthetic Grey Iron made in a Medium-frequency Electric Furnace and its Properties," by Mr. A. Plesinger and Mr. J. Klaban (of Brno); "Influence of Sulphur on Grain-size of Mild Steel after Deoxidation by Aluminium," by Mr. D. Papazoglou (of the Peugeot concern) and "Feeding-head for a Crown Casting made in Plain Carbon Steel, when using Exothermic Materials and Chills," by Mr. M. Jeancolas and Mr. X. Virolle (*Centre Technique*).

After these papers are presented, the two sessions will join together in the *Nouvelle Salle* when Mr. A. Brizon (past-president of the *Association*) will review the history of the *Association*. Following this, Mr. J. Boucher (president of the *Association*) will sum up the work accomplished.

In the afternoon, there is a choice of half-a-dozen foundries to be visited and particulars of these and other arrangements can be obtained by writing to the secretary of the *Association* at the Paris headquarters.

Luncheon

ALLIED IRONFOUNDERS, LIMITED

As a prelude to a visit to the Heating, Ventilating and Air Conditioning Exhibition held at Olympia, in which three of the Allied group of companies were participating—Aga Heat, Limited, Frederick Kay (Engineering), Limited, and Watts Metal Industries, Limited—Allied Ironfounders, Limited, were the hosts at a luncheon given on Tuesday, September 26, at the Kensington Palace Hotel, London. The luncheon, which was given for the group's major customers, was also attended by members of the technical Press, representatives of Government departments, Ministry of Works, and local authorities, some 70 people being present. Mr. G. S. Steven (vice-chairman and joint managing director of Allied Ironfounders) was in the chair, and speaking to the gathering during luncheon, stated that some emphasis was being placed nowadays on larger industrial heating boilers, *e.g.*, those of 4,000,000 BTU. As one result of the acquisition of Frederick Kay (Engineering), Limited, by the Allied group an 8¾-ton boiler of this type was then being exhibited on the second floor at Olympia. He also mentioned that boilers, though often quoted as "packaged" units, were in fact often tailor-made to customers' demand and requirements. Naturally, he said the other well-known domestic boilers, convector and other heating units of the group were also on show.

Forthcoming Events

OCTOBER 16 to 18

Institute of Metals

Conference on the "Metallurgy of Beryllium," at the Assembly Hall, The Royal Commonwealth Society, Craven Street, London, W.C.2.

OCTOBER 16

Institution of Production Engineers

Sheffield graduate section:—Works visit to Newton Chambers & Company, Limited, Thorncliffe, followed by a talk on a "Modern Mechanized Foundry," by a representative of the company, 7 p.m.

OCTOBER 17

Institute of British Foundrymen

East Anglian section:—"Art Bronze-founding," by A. L. Parrott, 7.30 p.m., at the Lecture Theatre, Ipswich Civic College, Rope Walk, Ipswich.

Institution of Production Engineers

Halifax section:—"Machine-tool Development in the USSR," by N. Stubbs, 7.30 p.m., in the Lecture Theatre, Engineering Tower, Huddersfield Technical College.

OCTOBER 18

Institution of Production Engineers

London-Brighton group:—"Modern Trends in Machine-tool Design," by E. R. Cash, 7 p.m., at the Old Ship Hotel, Brighton.

Wolverhampton graduate section:—"Shell Moulding and Its Recent Developments," by A. D. Lewis, 7.15 p.m., at the Wolverhampton & Staffs. College of Technology, Wulfruna Street.

OCTOBER 19

Institute of British Foundrymen

Northampton section:—"Recent Developments in Foundry Processes," by J. D. Hill, 7.30 p.m., at the Technical College, Church Street, Wellingborough.

OCTOBER 20

Institute of British Foundrymen

Bristol section:—"How the Work of the Technical Council assists the Foundry Industry," by M. M. Hallett, 7.30 p.m., at the Technical College, Gloucester.

Foundry Hotpot for IBF Visitors

Details of Establishments in the Manchester Area which are to receive Parties on October 27.

In accordance with JOURNAL custom participants in this year's Institute of British Foundrymen's National Works Visits Day are offered a preview of the establishments to be visited. The miscellany of plants open to view to the IBF members represents a veritable Lancashire "hotpot" of foundry organization. The day's visits—five of which are covered below—will be rounded off with a dinner in the evening when the hosts from the works will be the guests of the visitors. In all it is planned that twelve plants will be visited and it is intended that those not represented here will be described in a subsequent issue.

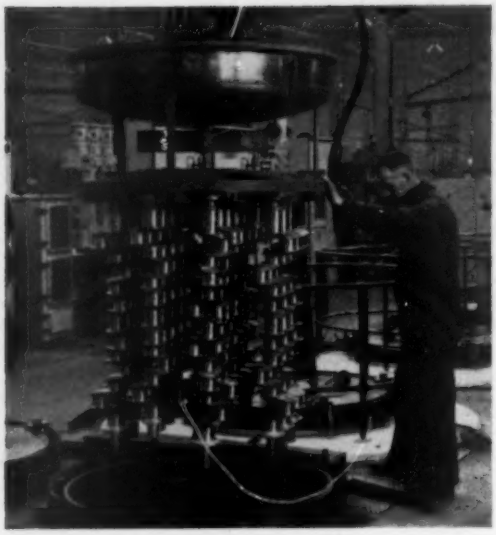
Leyland Motors, Limited

The history of Leyland Motors, Limited, dates from 1896, a year, which by general consent, saw the birth of road motor transport in Britain. Of the incredibly few people who were aware that a new era had dawned and proposed to keep in step with it were two young Lancashire men, James Sumner and Henry Spurrier, the latter being the grandfather of Leyland's present chairman and managing director. As partners, the two men formed the Lancashire Steam Motor Company, the direct predecessor of Leyland Motors, Limited. From a small works in Herbert Street, Leyland, 20 employees produced steam lawnmowers and wagons, which were so popular that by 1902 demand exceeded production capacity, and the building of a larger factory was undertaken. From this factory, in 1904 came the first Leyland petrol engine. As more and more people turned to the internal-combustion engine as a means of transport, so did Leyland keep pace by being in the forefront of the infant industry with its technical know-how and expanding output. Expansion swept on through the twenties, the thirties and the forties (when all production went over to the war effort), until by 1950 the company had truly become a world-wide organization. The Leyland group now comprises Albion Motors, Limited, Scammell Lorries, Limited, Standard-Triumph International, Limited, and West Yorkshire Foundries, Limited, as well as many other associate companies throughout the world. The group is claimed to be the Commonwealth's largest manufacturer in its class and the largest exporter of heavy commercial vehicles in the world.

Foundries

Farington Foundries, which form a large part of Leyland's Farington factory, occupy an area of

A view of the pouring station, part of the mechanized cylinder-block casting section at the Farington foundry of Leyland Motors, Limited, showing the fume canopy over the conveyor.



A batch of crankshafts being lowered into one of the vertical nitriding furnaces in the engine factory of Leyland Motors, Limited. The process produces a shaft that is 2½ times as hard as a normally-hardened shaft, and nearly twice as strong in resistance to fatigue.

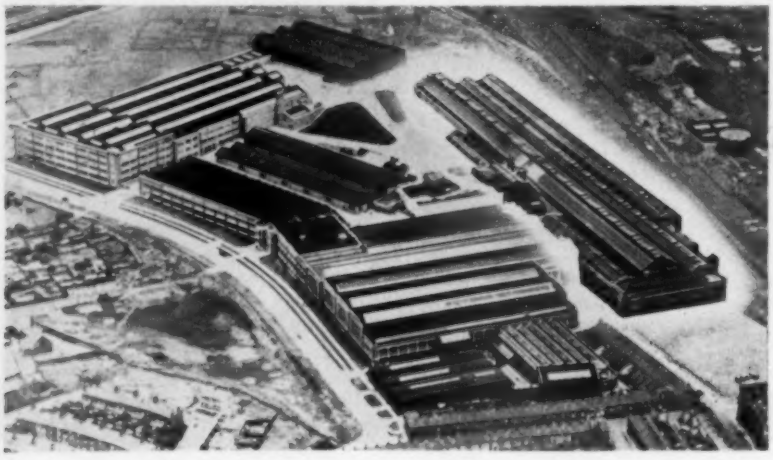
11,600 sq. ft., and comprise three principal bays measuring 350 ft. by 65 ft. Weekly production of cast-iron cylinder castings, of which two-thirds are destined for the Leyland group and the remainder for Jaguars, Rovers and Blackstone, exceed 300 tons. The centrifugal foundry for cast-iron liners and sleeves for Leyland cylinder-blocks produces about 40 tons a week. Weekly output from the steel foundry is 60 tons, 60 per cent. of which s absorbed by the group for hubs, rear axles, axle arms, casings and chassis-brackets, the other 40 per cent. going to companies in the oil-valve trade. These foundries, which employ over 1,000 men, are at the moment in the midst of a vast £1,000,000 expansion and modernization scheme. Chief among the improvements is the installation of two new melting-units comprising two 12-ton per hr. cold-blast cupolas made and installed in such a way that they can be converted to hot blast when required. Already in operation are two 6-ton mains-frequency furnaces which are used for reclaiming cast-iron borings. A proportion of the metal is made into pig-iron and returned to the cupolas, and the rest is used for cylinder castings.

Quality Control

Accuracy and quality control are assured in the jigging shop where all cylinder blocks and heads, and many steel castings, are balanced in jigs which are replicas of machine-shop jigs. Since the beginning of this year, Leyland cylinder head castings have been undergoing a supplementary cleaning-process which guarantees that all their intricate and inaccessible internal passages are completely free from traces of sand. The company have built a production plant in which the castings are immersed in molten caustic-soda. It was designed by Leyland engineers in close collaboration with ICI, Limited, and Thermic, Limited, using data obtained from trials on a pilot plant at the alkali division of ICI, Limited, Norwich.

British Northrop, Limited

In 1901, the late Mr. H. P. Gregg and Mr. W. Livesey saw in the United States the rotary pirn changing magazine, then recently perfected by Mr. J. Northrop, of Keighley, Yorks, who was at that time employed by an American textile-engineering company. Such was their interest that a year later, in 1902, the British Northrop Loom Company, Limited, was formed, their premises being only a corner of the Henry Livesey engineering plant in Blackburn. The first small works was erected in Blackburn in 1907 on the site now occupied by the company's sales and administrative offices. The manufacturing capacity of the



Aerial view of the Blackburn works of British Northrop, Limited, with the foundry division outlined; cupolas are visible on one of the long sides. The buildings were erected in 1934 and have been twice extended since.

company was gradually augmented to cater for increasing sales demand and, between the wars, despite recurring recessions in the textile industry, the firm continued to expand and built new machine-shops and erected new and larger bays and foundry buildings. Shortly after the outbreak of war in 1939, the company became engaged entirely on various forms of armament production, including the manufacture of machine-tools. At the cessation of hostilities, such was the cumulative demand for automatic looms that further extensions were urgently required. The foundry was therefore enlarged and new production machine-shops were built and, in 1946, a four-storey woodworking department was added.

To-day, the British Northrop premises cover a floor area of 1,100,000 sq. ft., and high-speed automatic looms are manufactured almost in their entirety down to practically every single nut and bolt. In 1958, the company expanded its engineering interests and acquired complete control of Chaseside Engineering Company, Limited.

Foundry

The present foundry buildings (page 446) were erected in 1934 and extended in 1937, and again in 1947; they now cover an area of about four acres. The original foundry was brought into use shortly before the first world war. The present foundry division employs some 340 workers, of whom about 30 are engaged in the pattern shop. The extensive pattern stores contains more than 100,000 patterns, and these are being added to at the rate of about 1,000 per year. Upwards of 800 different patterns are used per week. The output is chiefly grey iron of grade 14, but some non-ferrous metals are also cast. There is also a small shell moulding section, using pre-coated sand and equipped with one double Fairburn Lawson Combe Barbour machine.

Five cupolas are installed, but only two, lined down to 42-in. dia. at the melting zone are used on alternate days. Some 250 tons of metal are melted per week by three men, one of whom is chiefly engaged on driving a Chaseside Loadmaster Loading Shovel, which has been adapted for cupola charging, using a drop-bottom bucket as shown in column 2. The cupola stock yard is at charging hole level.

The main crane bay, which is 1,000 ft. long and 75 ft. wide, has two 5-ton overhead travelling cranes. At one end of the bay the non-ferrous section is situated and the bay also contains the snap flask and medium roll over machine sections.

Thirty No. 275 Osborne snap flask machines are currently in use, and the medium roll over section has 12 machines in use.

The stationary Beardsley and Piper sand slinger is used in this bay to ram up the larger moulds. At the other end of the bay the sorting of castings takes place after dressing. All floor moulding is carried out in this main (No. 1) bay.

No. 2 bay accommodates three tractor type Beardsley & Piper sand slingers, ramming up 6 ft., 8 ft. and 10 ft. boxes for Loom side connecting beams, and also the 4 ft. 6 in. by 4 ft. boxes for Loom sides.

No. 3 bay houses the bench moulders and the No. 601 Osborn heavy roll-over machines, and also the core shop and dressing shop. Cores are mainly oilsand, dried in an Acme core oven. Some of the larger cores are made by the CO_2 Process. The laboratory is also housed in No. 3 bay, where routine control of sands and metals is carried out.

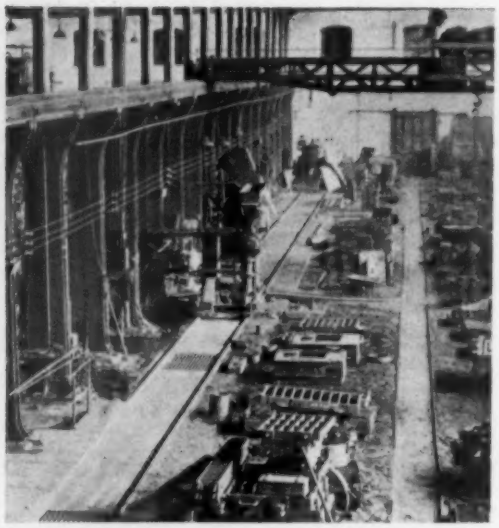
A night shift is engaged in sand reconditioning and knocking out on certain sections. Extensive use of Royers is made for reconditioned backing sand. The facing sand using Bromsgrove Red is prepared in an "August" unit. Another "August" Mill prepares special facing sands for various units.

Thomas Robinson & Son, Limited

Although the records of early transactions go back to 1813, the story of Thomas Robinson & Son, Limited began officially with a partnership between father and son for the purpose of manufacturing household joinery. In 1880 a limited company was formed, which in the same year began to manufacture flour-milling machines of the roller-reduction type—which were at that time revolutionising the flour-milling industry—together with their ancillary equipment. This necessitated the installation of a full-scale woodworking plant, as originally flour-milling machines were mainly of wooden construction. This plant has since been kept up-to-date and gives the company the advantage of being able to test their woodworking machines under actual working-conditions.

To-day the company manufactures a wide range of woodworking machines, together with machines for flour milling, seed cleaning and allied trades.

Chaseside "Loadmaster" loading shovel adapted with a drop-bottom bucket for cupola charging at the foundries of British Northrop, Limited.



General view of the heavy section of the Thomas Robinson & Sons' foundry showing (left, centre) the mobile Sandslinger.

Services offered by the flour-milling division include the design, building and furnishing of complete plants.

Foundry

The workshops and offices cover an area of some 13 acres in three main groups: (1) Main works and offices; (2) branch works and (3) timber department. The main works consist of pattern shop and pattern stores, foundry, with open-bar storage and covered storage for small castings, fettling shop and smithy, machine and fitting shops and test and packing departments. The general layout provides a fairly-straight-forward flow from foundry to packing department.

The pattern shop is equipped mainly with Robinson machines, and the foundry handles castings of up to 10 tons, and with a weekly output of some 45 tons. It is 75-per-cent. mechanised, with two 750 lb., one 4,500 lb., and one 1,500 lb. jolt/rollover moulding-machines, and two small moulding-machines adapted for specialized work. Also in the foundry are two Sandslingers, one fixed and the other mobile. Three 5-ton-per-hour cupolas which are charged semi-automatically and one 2-ton-per-hour cupola are provided. Castings include chilled-iron, high-duty, high-duty alloy and Ni-hard in addition to the lower grades. A speciality is the centrifugal casting of chilled-iron rolls. A sand-reclaiming plant collects from all parts of the foundry by under-floor belting, and stores the returned sand in two 40-ton hoppers. A mixing plant adds bentonite, coal dust and fresh sand to the reclaimed sand, and then stores it in four hoppers for re-use. Small cores, mostly of the oilsand type, are made in a separate coreshop and oven dried, although CO_2 cores are sometimes used for certain applications. Close to the foundry is the metallurgical laboratory. In addition to the iron foundry there is a non-ferrous foundry handling aluminium and brass. Compressed air, which is used in the foundry to a large degree, is supplied by a battery of air compressors. The fettling shop for iron castings has a wheelabrator and high-pressure shotblast plant, which is used to remove cores—in addition to its normal work—and the usual wheels and tumbling barrels.

Other Plant

The machine shops which owing to the wide range of work in progress contain a wide range of machine tools, including planers, plano-millers, shapers, large and small drilling machines, horizontal borers and drillers, internal grinders and honing machines, turret lathes, gear planers, grinding machines, both cylindrical, surface and slideway centre-lathes, screwcutting lathes and a large copying lathe. These shops also contain many special machines for the manufacture of bandsaws, bandsaw pulleys and flour-milling rollers. The fitting shops are equipped with lifting gear, including overhead cranes of up to 10-tons capacity. Testing shops, for both the woodworking and flour milling machines, permit all machines to be fully tested before despatch. One of the latest additions is the formation of a small department for the manufacture of fibre-glass components, for which increasing use as guards and covers is being found. The whole of the main works is heated from a three-boiler steam plant, which is oil-fired by one of the most modern systems. The branch works, which is about 300 yards from the main works, consists of a flour-milling fitting department for dealing with light flour-milling machines, and a sheet-metal department. The latter is equipped to deal with sheet metal of up to ¼-in. thick, and includes guillotines, bending machines, bending rolls, benches and presses, and spot-welding plant. The timber department, opposite the main works, consists of a sawmill, fully-equipped to manufacture all the timber work called for in flour-milling machinery manufacture and a joiners' shop for the assembly of many types of flour-milling machines. Below the sawmill and joiners' shops are extensive drying chambers in which the timber used can be suitably seasoned for use in the atmosphere of a flour mill. In the same area as the timber department there is a yard for the storage of rough-cut timber, and a research building devoted to the investigation of flour-milling problems.

Craven Brothers (Manchester) Limited

The firm of Craven Brothers was founded in 1853 by two brothers Greenwood and William Craven, who were at the time employed by Fairbairns of Manchester. They were later joined by a third brother, John, who became the businessman of the

firm. The original Craven premises were situated in Salford, but expanding business compelled a move first to Manchester in 1863 and finally to entirely new premises in 1920 at the present Reddish works. Mr. Greenwood Craven became the first chairman when the firm was converted into a limited company in 1885. In 1928 the company absorbed the machine tool departments of Sir W. G. Armstrong Whitworth & Company, Limited, Thomas Shanks & Company, Limited, and Joshua Buckton & Company, Limited, whose manufactures were concentrated with those of Craven Brothers at Reddish now cover a floor area of 430,000 sq. ft., established Craven crane business, and immediate extensions to plant and buildings. The present chairman and managing director, Mr. James Lauchlan, joined the company in 1928 and was appointed a director in 1938.

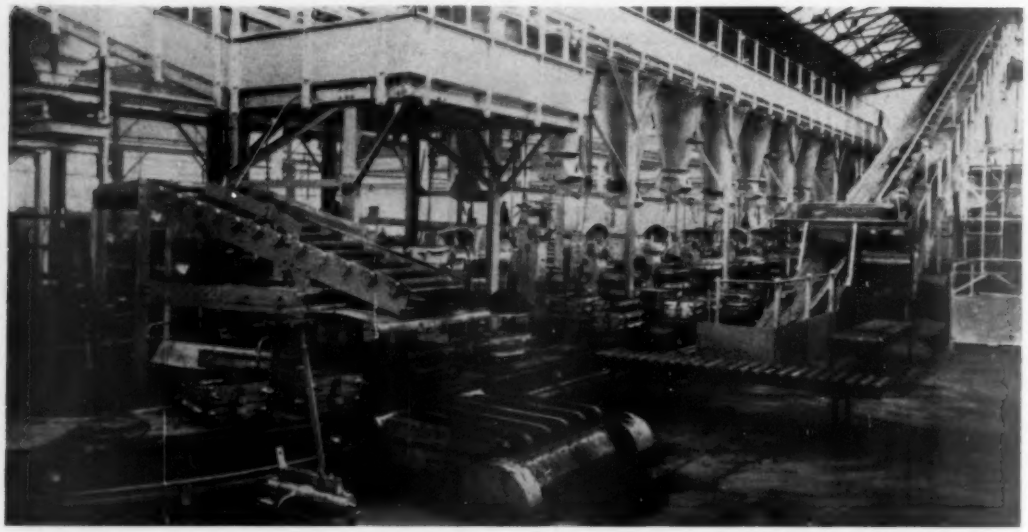
Continuous extension of plant and buildings has taken place in the past thirty years, and the buildings at Reddish now cover a floor area of 430,000 sq. ft., to which must be added 62,000 sq. ft. of gallery floor space. The number of workpeople normally employed is about 1,500, and a comprehensive apprentice-training scheme is in operation, with a separate fully-equipped workshop and a competent instructional staff.

The foundry floor at Thomas Robinsons & Sons, showing the mould-drying plant and the stationary Sandslinger in the background.

Foundries

The design offices have accommodation for some 100 draughtsmen and designers. There are both light and heavy sections of the pattern shop and buildings for the storage of patterns. The iron foundry covers an area of about 70,000 sq. ft. including a separate fettling shop. It can supply all the iron castings required, including single units up to 40 tons weight, the total output being between 3,000 to 4,000 tons per year. The equipment includes four cupolas of 2, 5, 8 and 14 tons-per-hour capacity, sand mixing and drying plant, and five large core-drying stoves. The sand-moulding floor is well suited to large work, a depth of 14 ft. being available without risk of water seepage. There is practically no repetition work, all castings being made from wood patterns. In the two main bays floor-type drysand moulding only is used, but in a separate small self-contained foundry, capable of dealing with work up to one ton weight, both drysand and greensand methods are used. No steel casting is carried out on the premises, but a separate small foundry supplies all the non-ferrous castings required.

Part of the main foundry floor at Craven Brothers (Manchester), Limited, where there is a 14-ft. dry depth available for pit moulding.



Advanced mechanization at the Bradley Fold foundry of Dobson & Barlow, Limited, is well demonstrated in this view of the continuous-casting plant.

Machine Shops

The heavy machine shops occupy a floor area of 62,000 sq. ft. and contain 21 planing machines, the largest admitting work up to 14-ft. wide by 12-ft. high by 35-ft. long, and 31 horizontal-boring machines, including an 8¼-in. spindle travelling-column machine. There is also a vertical-boring-and-turning mill to machine work up to 28-ft. diameter by 13-ft. high. The light-machining section covers 60,000 sq. ft., containing modern machine tools of all types. Of interest are a special screw-thread corrector lathe and a master-wormwheel hobbing machine, both installed under temperature-controlled conditions. There is a separate section for gear cutting, with facilities for cutting spur, helical, and worm and wormwheel gears, straight and spiral bevel gears, etc. One outsize hobbing machine of Craven manufacture installed in the plant will cut gear wheels up to 27-ft. diameter. The tool room is of sufficient capacity to undertake outside orders for jig-and-tool work in addition to fulfilling all the needs of the Craven works and products. There is also a heat-treatment department and metallurgical laboratory. A special section of the erection department is allocated to the rebuilding of used machine-tools of all makes.

Production

At the outset, the firm undertook machine-tool work of a very-general nature, but gradually prominence was given to machines required in the railway workshops. Railway machine-tools still constitute a considerable proportion of the total output, but the emphasis in this section is now on machine-tools for the manufacture and maintenance of wheels, tyres, axles and complete wheel sets. The present range of products includes the larger types in most classes of machine tools as used in steelworks, shipyards and heavy engineering and electrical industries. Most important among these are large lathes, vertical boring and turning mills, roll lathes and roll-grinding machines, planing machines and gear-hobbing machines, including such giants as a 42 ft. vertical-boring-and-turning mill and a 21 ft. gear-hobbing machine. In the erection departments the visiting foundrymen will be able to see a number of large machine-tools of various types in the course of erection.

Dobson & Barlow Limited

The early days of Dobsons were intimately bound up with the invention of the spinning mule by Samuel Crompton and the growth of industrial Lancashire which came in its wake. They were early specialists in the manufacture of textile machinery in 1790 and 100 years later were pioneers in the building of spinning machines for the commercial production of viscose rayon. Much of Dobson's history is closely associated with the rise of Bolton as an important industrial centre and the home of fine-yarn spinning and modern engineering.

Premises

To-day, the company's factory occupies over half-a-million sq. ft., in rural surroundings at Bradley Fold, and produces a wide range of manufactures which are meeting the complex needs of a variety of industries throughout the world. At Bradley Fold foundrymen will have the opportunity of see-

ing up-to-date production plant and techniques employed in the manufacture and assembly of a diversity of plant, including: Rayon machinery, transparent-cellulose film machines, synthetic or man-made-fibre machinery for processing Nylon, Terylene and other modern filaments, cotton-spinning machinery, tufted-carpet yarn-spinning frames, asbestos-spinning frames, cone-roving frames for worsted yarns, sizing machinery, machinery for washing and treating bottles in the brewery trade, labelling machines, and general engineering. Because of this great variety of industries catered for, the machine tools employed are, for the most part, of general-purpose type. A heavy-erection shop with crane facilities is available for the larger machine units.

Foundry

The foundry is extensively mechanized and consists of a sandslinging plant, a continuous-casting plant, and a medium- and light-loose-pattern moulding section. Metal is provided by two 8-ton per hr. hot-blast water-cooled cupolas fully instrumented. Large quantities of castings ranging from a few ounces to approximately three tons are supplied to constituent companies in the Textile Machinery Makers, Limited Group. To keep abreast of technical advances, considerable resources are devoted to development work. Piecework rates apply wherever possible, and production is fully standard-costed, with budgetary-control in all departments.

Employees

Many of the workpeople are the sons and grandsons of former employees and are drawn from an area where textile machinery has been a traditional occupation for a very-long time. In spite of Bradley Fold Works rural situation, there are few problems regarding transport of personnel. A fleet of buses brings employees to the works each morning and assembles again to take them home in the evening. Supplementing public transport is a growing number of cars in the works car-park—a pleasant sign of current trends. Comprehensive amenities and welfare services cater for many of its requirements, employees and staff, and a progressive apprentice-training scheme plans for the future of young persons who enter the company's service.

Unit comprising part of the sandslinging plant in a section of Dobson & Barlow, Limited's foundry.

Grain-size of Steel

Various elements are used to control grain-size, which is an important factor in determining the characteristics of finished steels. The most widely used is aluminium, which inhibits grain-growth by raising the grain-coarsening temperature of steels. An investgation to determine the percentages of aluminium which will give effective grain control and to find the optimum method of addition, has been carried out by the steelmaking division of the British Iron and Steel Research Association.

From this it has been established that grain-coarsening temperature rises as the aluminium content is increased, and reaches a maximum point when the aluminium content is 0.04 per cent. If consistent production of fine grain-size is to be ensured, the aluminium content must not drop below a minimum of 0.01 per cent. It was also established that the moulds and pouring trumpets are the most effective points at which to make aluminium additions to molten steel, the aluminium losses here being smallest.

An interesting conclusion drawn from these tests is that the measurement of aluminium content of a steel provides a reliable, quick, and less expensive alternative to the McQuaid-Ehn Test for evaluating grain-size.

Import Duty Exemption

The Board of Trade give notice that they are considering an application for the exemption from import duty of the following goods:—(1) Electrolytic manganese metal of a purity not less than 99.5 per cent. (2) Manganese nitride containing not less than 4 per cent. by weight of nitrogen in all. A statement of the applicants' case will be made available to all interested parties who wish to make representations in the matter, if they are prepared to give an undertaking to treat the information contained therein as strictly confidential and to allow their comments to be passed to the applicants for reply. Requests for a statement of the case, together with an undertaking in the terms set out above should be addressed in writing to the Board of Trade, Tariff and Import Policy Division, Horse Guards Avenue, London, S.W.1, not later than October 18. Comments from interested parties who have seen the statement of the case should be sent to the same address by October 25.

INTERNATIONAL COMPUTERS AND TABULATORS, LIMITED, announce an agreement with the Radio Corporation of America for the non-exclusive exchange of technical information and patents in the field of data processing.

Equipment & Supplies

Flexible Moulding Material

Split metal moulds, with undercuts, can now be cast by a process which involves the use of flexible moulding materials sold by Vinatex, Limited, Devonshire Road, Carshalton, Surrey, under the name Vinamold. The new procedure has been developed by Mr. A. E. Young, 112, Evelyn Crescent, Sunbury-on-Thames, and should be of particular interest to manufacturers of split moulds or for corebox blowing. The process can also be used for die production. The manufacture of moulds by this process is said to be cheaper than casting from a pattern, using prints to deal with the undercuts, or, on the other hand, machine copying; this is especially so when a negative mould is wanted. The process depends on the production of a positive model which is easier to make than a negative one, with undercuts and interior detail.

FIG. 1.—*Mould—containing an undercut—produced in Vinamold material, together with its plaster backing piece (Vinatex, Limited).*

The mould material is suitable for receiving casting plaster and other materials. It is available in varying hardnesses and melts at temperatures from 120 to 170 deg. C. (248 to 338 deg. F.) to give liquids suitable for pouring over a model to form a mould. Such moulds are reported to be tough and retain a sharp impression of fine detail; they can be used repeatedly and, when worn out, can be melted down and used again.

The results obtained are indicated in Fig. 1, the methods being similar to those in use for pressure-cast pattern production. First a positive pattern is produced in wood, plaster or plastic, mounted on a board larger all round than a standard moulding box, with a wooden frame built round the pattern. The recommended grade of Vinamold is then melted and poured into the space between the pattern and the wooden frame and the mould set-up is next surrounded with plaster as a reinforcement. After the plaster has set and dried, investment plaster is poured into the Vinamold mould, this when set is placed in the bottom of the moulding box. Pouring channels are made and metal is cast in the usual way, only a small amount of cleaning and finishing being required. The other halfmould is obtained by repeating the process, using a model with a reversed parting surface. This can be obtained by casting plaster directly on to the original model and removing the first parting surface.

Closed-circuit Television

Wolsey Electronics, Limited, Cray Avenue, St. Mary Cray, Orpington, Kent, have been appointed distributors in the British Isles of Grundig closed-circuit television. With this new industrial "tool," it is now possible, the firm state, to view processes and control production on a scale quite impossible before—wherever it is difficult, dangerous or uncomfortable for the human observer, as, for example, in several "foundry" environments. Among other advantages claimed by the manufacturers for the system is that it will also help to improve manufacturing, industrial efficiency and safety.

One of the most recent developments in this field has been on the use of an industrial camera with an infra-red Vidicon tube, and Professor W. Heinman and Dr. C. Kunze of P.T.W. in Wiesbaden, Germany, have developed such a tube that, they claim, will operate on wave lengths of 1.9 microns deep in the infra-red spectrum, and the Grundig FA "40" camera has been developed with this tube. Applications envisaged include infra-red microscopy; infra-red viewing systems with reflected or emitted light where the temperature is greater than 200 deg. C; temperature measurement; and security.

The Grundig FA "40" equipment consists of a small size lightweight television camera, a power unit, and monitor; ancillary equipment for special purposes and applications is also available. A comprehensive planning and consultative service which is available free of charge, includes visits to foundries and other industrial premises as may be necessary to carry out surveys and plan installations.

Heat-treatment of Pipes: AEI-Birlec, Limited, have secured an order for the supply of three roller-hearth furnaces to Stewarts and Lloyds, Limited, Corby Works, Northants. Two of the furnaces are rated at 2,080 kw, to operate at a maximum temperature of 1,000 deg. C., and the other is rated at 1,200 kw for a maximum temperature of 750 deg. C. Each is capable of an output of 8 tons of steel tube per hour at the appropriate temperature, the maximum diameter of tube being 6 in. and maximum length 50 ft. The furnaces are adaptable to blue/black annealing, bright annealing, normalizing or low-temperature treatment. Valued at over £200,000, the plant is to be commissioned during 1962, and will probably represent the largest of its type applied for this purpose.

Timber Preservation: Extensive damage to structural timber can be prevented if the outbreaks of rot and woodworm are treated in the early stages. A new firm in this field is Property Preservation of 90b, High Street, Reigate, Surrey. The firm report that they operate an extensive free inspection service carried out by qualified and experienced staff, backed by mobile teams of timber-treatment specialists.

An agreement has been signed between Research and Control Instruments, Limited, of Kings Cross, London, W.C.1, and Sonatest, Limited, of London, W.C.1, to the effect that marketing in the United Kingdom of Sonatest Ultrasonic non-destructive testing equipment will be carried out exclusively by Research and Control Instruments, Limited.

Die Design Symposium

LMFA Event brings together Kindred Interests to Birmingham

The first of its kind, last week's Die Design Symposium, organized in the Queen's Hotel, Birmingham, by the Light Metal Founders' Association, was an unqualified success. The one-day event which started at 10.45 a.m. attracted an attendance of over 120 delegates from between 30 and 40 die-casting firms; research associations and the technical Press were also represented. In the chair was Mr. L. Fletcher, LMFA past-chairman, who first apologized for the unavoidable absence of the present chairman, Mr. L. R. Carr, M.P. Opening the proceedings, Mr. Fletcher said that the attendance was very gratifying and would serve as a guide to future programme planning by the Association. Briefly reviewing die-casting over the 50 years since the process was first developed, he said that most satisfactory progress had been made but the industry should be eager to do more and there was plenty of scope, because metal poured into dies still represented only two per cent. of the total castings market (presumably Mr. Fletcher meant production "by weight."—EDITOR).

Papers Presented

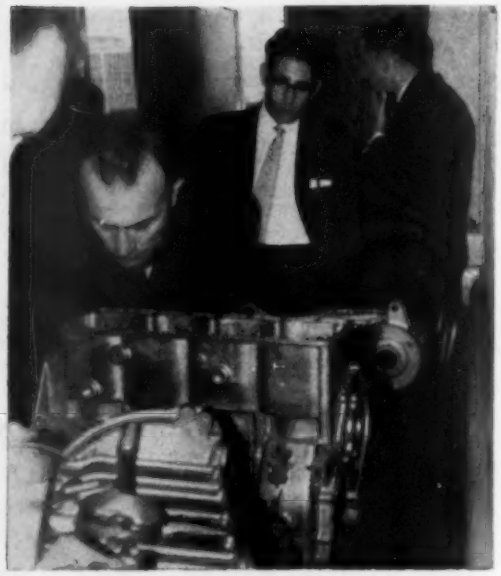
Thereafter, Mr. Fletcher introduced the Author of the first paper. The morning session included the presentation and discussion of two contributions on gravity-die-casting, namely: "Basic Principles of Die Design" by Mr. W. Goode (Birmingham Aluminium Casting Company (1903), Limited), and "Casting Cost Control in Gravity-die Design for Aluminium Alloys" by Mr. R. R. Woodward (High Duty Alloys, Limited). The afternoon's session—following luncheon by the delegates in a private room of the same hotel—was concentrated mainly on aspects of pressure-die-casting, and there were again two major contributions presented and discussed, viz.: "Pressure-die Design" by Mr. W. M. Simpson and Mr. R. B. Bryan (Metal Castings Doehler, Limited) and "Report on American Die-casting Plants" by Mr. G. P. Welch (Wolverhampton Die Casting Company, Limited).

The attendance at the meeting seemed fairly evenly divided in interest between gravity- and pressure die-casting and there were very good and lively discussions. All except one of the papers were preprinted, but in the main, the text was used only as a basis for elaboration by the speakers.

The first paper dealt initially with product design leading to basic principles of die construction and then, in turn, surveyed casting control features, runners and feeders and thermal aspects. At discussion time, the chairman described this as a most practical contribution, stressing the need for collaboration by founders with the product designer. Delegates obviously agreed with this assessment, though one of them asked what was a "product designer," saying that in his experience he had not encountered such a person. He did, however, agree it would be a vast improvement if there were among customers' staff those with whom die-casters could really get down to details on design.

One interesting point arising out of the discussion was the reply to a query as to whether there were any alternatives to cast iron for gravity dies. Here, one of the contributors mentioned that in a small way his company was producing some dies

Views of the audience and the chairman's table respectively during the Symposium on Die Design, organized by the LMFA last week in Birmingham. The chairman (second from right behind the water jug) is Mr. L. Fletcher. On his left is Mr. R. R. Woodward giving his paper on "Cost Control."



At the Die Design Symposium, delegates were particularly interested in a specimen casting of the Volga cylinder-block produced on the new Triultzi 2,200-ton die-casting machine.

in aluminium LM 4 alloy. A second contributor agreed that this type of die material was proving very satisfactory for relatively small numbers of castings off (see later).

Modification for Mechanical Operation

Mr. Woodward prefaced his paper on cost control by an unscripted survey of the potentialities of different die-casting processes, saying that in the main the industry was too complacent and gravity-die-casters in particular should be preparing for increasing competition by adapting all means equipment and mechanical aids to make themselves more efficient.

He then continued by dealing with die and process modification favouring mechanical operation, and in particular with (*a*) cost control as a function of design, time and labour utilization; (*b*) effect of design on product quality, and (*c*) metal yield; (*d*) and (*e*) die and fettling costs, respectively, and (*f*) mechanization—powered and unpowered. This paper was illustrated with sketches and photographs of plant installed in the Author's works. Mr. Woodward stressed the merit of top-pouring of gravity-die-castings through the feeding-head and his final illustration showed a finned cylinder-head casting produced in this way.

In the discussion, which followed, the Author remarked pungently that the average housewife has more control of her cooking than gravity-die-casters of their dies—this was when referring to general lack of knowledge of heat-exchanges which took place when die-casting. It was during this discussion that Mr. G. L. Bailey, director of the British Non-Ferrous Metals Research Association, asked if his Association could assist die-casters with basic research and if so where were the gaps in present knowledge.

Afternoon Sessions

Introducing the first paper at the afternoon session, Mr. Bryan posed the question initially as to whether it was policy to have a large pressure-die-casting machine with interchangeable unit dies or whether it was better to have a series of smaller machines. He then outlined the Doehler-Jarvis set-up in America (and now in this country) dealing with standard practice as regards die construction, machine detail and modes of operation in each case. In this context, he discussed feed bushes, plunger length, operating centres, goose-necks and hydraulics.

Continuing an extensive review of American practice, he discussed the merits of standardization as applied to moving parts, die supports, the desirability of non-return valves, composite die construction, waterways, etc., and followed this up with a note on the possibility of spark-errosion techniques for die-making. In this latter connection, he exhibited a large motor-car front grille—a composite of two castings about 5-ft. wide (with headlamps included)—for the dies of which spark-erosion was used, with a tungsten-tipped electrode blade.

Discussion on this paper centred around points of detail as, for example, possibilities of the Sulfinuz process, danger of cracking of nitrided pads at corners, application of vacuum to die-casting and the elimination of joint-lines on castings produced from composite dies.

Plant Survey

The final paper by Mr. Welch consisted of extracts from reports on American plants which he had prepared during and after his attendance at last year's die-casting congress in that country. Time only permitted of his presenting about half-a-dozen of these reports, but members present much appreciated the detailed information of plant design and utilization which were made available and the candid way in which these were presented. Again at discussion time, delegates were clamouring for still more detail, questions being related to such topics as automatic ladling of magnesium, whether die-sinking from component drawings only was practised widely in US, water-spraying of dies, quick die-making methods, die costs and experiences with dies produced by the Shaw Process.

Castings Exhibition

In addition to the castings used for demonstration purposes by Mr. Bryan, a small exhibition of

notable die-castings, both pressure and gravity, in various aluminium, magnesium and Zn-base alloys, had been assembled at the back of the hall. In the gravity section, this included a clutch-housing for the SAAB car, an armature cooling fan about 30-in. dia. and weighing 49 lb., a soleplate for Hawker aircraft in Mg/Z 5Z alloy and a Carlson beer filter-plate. The single low-pressure die-casting exhibit was a finned cylinder-head for the De Havilland "Gipsy Queen" engine. Pressure-cast examples included the base and main plate for a cine-projector, typewriter base, cover, bell-crank bracket and side cover casting, both Lambretta and Gilera crank and transmission cases and two designs of four-cylinder block castings.

One of the latter was the Volga unit produced on the recently-publicized Triulzi 2,200-ton machine and photographs of this machine and its operation were also on view. The pressure-die-casting exhibits also included a Villiers 150-cc. cylinder and crank-case and head castings.

Notable amongst Mr. Bryan's other exhibits was an experimental D-J air-cooled aluminium cylinder for a two-stroke power-saw engine. In place of a cast-iron liner, this cylinder had a sprayed-metal insert (actually reported to be of sprayed "cast" iron; although it was said many other metals could be used). It appears that the metal is first sprayed on to a collapsible mandrel and the aluminium is cast around it, the mandrel being subsequently cooled and withdrawn leaving the deposit bonded to the cylinder wall—and of a millimetre or so thickness.

Rapid Production of Cast Dies

Referring to the alternative and cheap method of producing aluminium gravity dies for small quantity production, it was learned that such dies are produced as follows: A master model of the component required is first embedded in a sand half-mould and a top-half mould also in sand is then produced. A metal thickness equivalent to that of the required die is then carved out of the impression in the top half-mould.

After both halves of the mould assembly—with the pattern—have been torch heated, the top half-mould is then replaced on the bottom half, with the "pattern" still in position, the pattern being coated beforehand with an ordinary die-coat material. Through convenient runners, aluminium alloy (LM 4) is then poured into the space between the pattern and the carved top half-mould producing, in effect (on solidification), a half die. Turning over the whole assembly enables the bottom half-mould to be removed, and thickness to be carved, followed by reassembly and casting of the bottom half-die directly on to the original pattern. After knocking out and extraction of the original model, such dies could be used, it was said, for up to 500 castings off, of good accuracy and surface-finish and using only a normal die-coat dressing as preparation. A similar system can, of course, be used for producing duplicate coreboxes for ordinary foundry practice.

Nine-Floor Storage Premises for Austin Motors

Birmingham's Chief Constable, Mr. E. J. Dodd, formally opened on September 25 the £500,000, nine-storey new storage premises at the Austin Motor Works, Longbridge. The 17-acre car-storage area is claimed to be the largest building of its kind in the world, and is described as "a vertical continuation of the assembly lines." The 10,000 ft. of balustrade for the total sheeted area of 45,000 sq. ft. is of aluminium, enamelled grey.

The new premises are part of the British Motor Corporation's £49,000,000 expansion programme by which output at the Longbridge plant is to be increased from 8,000 to 10,500 vehicles a week by 1962. To reach this target there is to come into operation shortly a large building for the finishing and final assembly of 2,500 vehicles a week, which is to be erected on land formerly occupied by vehicles awaiting despatch. It is hoped that the new car assembly building, No. 2, will be ready for trials next April with production starting in August.

The new multi-storey car park which can house 3,000 vehicles awaiting despatch includes some interesting features. All parking floors are ramped and a double spiral system of floors enables upward and downward movement of traffic to be segregated. The embossed aluminium sheeting used for the balustrading incorporates a technique by which sheets of coloured plastic are welded to the aluminium sheets. The building is to be used mainly for cars meant for export and one of its major advantages, it is stated, is that it will absorb night-shift production of vehicles. The building has been visualised as a full "pipeline" flowing continuously with cars.

It is stated that costs of building the multi-storey storage plant work out at £165 per vehicle space, and the storage capacity is equivalent to 38 per cent. of weekly production output when it is running at 8,000 vehicles a week. About 1,000 tons of reinforcing steel rods were used in the concrete. Construction (by Robert M. Douglas, Limited, and British Lift Slab, Limited) was by the patent Lift Slab method by which all floor slabs were cast at ground level and jacked up on columns to their correct positions.

The building is 376-ft. long and 204-ft. wide and its height of 72-ft. brings its topmost point to 722-ft. above sea level. The entire project has the effect of converting two acres of ground area into 17 acres of car storage on nine levels. There are eight lines of parking stances across the width of the building served by four roadways.

Belgian Foundry Technical Centre

A Belgian foundry centre, *Centre Belge de Fonderie*, has been established in Brussels, its aim being to co-ordinate, direct and develop all collective scientific, technical, technological and economical activities in the Belgian foundry industry. It will also assist foundries with technical assistance, development of professional training, promotion of castings and diffusion of Belgian and foreign technical documentation. Mr. J. Goffart, head of the Seraing foundries of Cockerill-Ougrée, is president of the *Centre*, Mr. F. Hebrant (manager of the research centre of the Belgian metallic industries) is manager, and Mr. A. Pirson is secretary.

American Letter

Foundry Conference

About 30 technical papers were presented at the American Foundrymen's Society's east coast regional foundry conference, held at the Hotel Statler-Hilton, New York City, on September 22 and 23. All the papers contained information of practical value, and what follow are some of the main points raised.

Under the title "Solidification Studies on Steel Castings," Merton C. Flemings, associate professor of metallurgy, presented a summary of recent research on solidification of low-alloy steels, and discussed the use of micro-radiography as a "tool" to determine very fine microporosity. Other subjects covered included a description of the conditions necessary to produce castings free of very fine microshrinkage, relationships between thermal gradients, casting structure, soundness, and mechanical properties. Mr. R. W. Ruddle, chairman, brass and bronze research committee, Foseco Inc., Cleveland, discussed recent developments in the soundness and properties of copper-alloy castings, including the development of a bar-test casting in which thermal gradients during freezing were measured; a method of assessing soundness by pressure testing thin sections cut from the bar casting at various locations; freezing soundness and mechanical properties in red brass in various conditions; influence of variables such as pouring temperatures, chilling and other factors; a progress report on research with such alloys as 80/10/10, 88/8/4, aluminium-bronze, manganese-bronze, silicon brass and nickel silver.

In a paper entitled "Better Castings through Improved Communications," Mr. W. J. Reichenecker (of materials laboratories, Westinghouse Electric Corporation, East Pittsburgh), stated that the many advances made in foundry technology had not always been used advantageously because of poor designer/buyer/foundryman communications. Mr. Reichenecker discussed the relationships between designer, buyer and foundryman, and put forward improved methods of communication which, he said, would materially benefit both the user and designer while encouraging the general use of castings and preventing waste costs for the foundryman. On the subject of "Post Inoculation of Spheroidal-graphite Iron," Mr. W. C. Jeffrey (of McWane Cast Iron Pipe Company, Birmingham, Alabama) discussed the addition of a graphitizing agent to s.-g. iron after initial magnesium inoculation. The graphitizing agents considered were 75 per cent. ferro-silicon and 62.5 per cent. calcium-silicon. Consideration was also given to post inoculation as it helped to control such mechanical properties of s.-g. iron as ductility and toughness in the as-cast condition.

In his contribution, Mr. W. R. Jaeschke (of the Whiting Corporation, Harvey, Illinois) emphasized the importance of the selection of coke and metallics for the charge, accuracy of charge make-up, distribution of the charge in the charging bucket and cupola, and the importance of general fundamentals of cupola operation in the production of duplex malleable. Mr. E. G. Gentry (Humble Oil and Refining Company, Detroit) spoke on "A New Moulding Medium for Brass and Bronze," discussing the development of a new form of carbon—a round, hard carbon particle, not pulverized—and how it was being used as a moulding medium for castings. The paper covered the origin, physical characteristics and details of application of this material and its applications in "greensand" moulding, baked cores, shell, CO_2, and bakeless-binder cores. Techniques, advantages and disadvantages were suggested for castings generally produced in zircon and olivine sands and for castings not easily produced from regular silica foundry sands.

Iron *versus* Aluminium

According to the August 21 issue of *Metalworking News*, aluminium's inroad in the automobile industry has awakened US ironfounders to the realization that unless they improve their products and techniques and bring costs down, they will lose ground to aluminium. One of the ways foundrymen have chosen to fight back is with s.-g. iron, and one such development in recent months is the decision by the Chevrolet division of General Motors Corporation to invest $3,000,000 in the construction and equipment of a foundry-research laboratory in Saginaw, Michigan, where GM already has its huge central foundry division. The new Chevrolet facility is expected to produce a number of parts made of s.-g. iron, such as camshafts, but most significantly, it will also be engaged in research and development of an s.-g. iron engine block. Whilst Chevrolet sources say that the s.-g. iron work is just another effort to stay abreast of new and possible developments, engineers and suppliers working with the division report that the goal is to obtain a ferrous engine-block of lighter weight which could be cast at faster rates than the Schmidt low-pressure permanent-mould system at present used to cast aluminium parts at the Chevrolet plant in Massena, New York. Some feel that the weight of the present grey-iron engine-block castings can be reduced by as much as 25 to 30 per cent. and thus bring the cost of the cast block well within 25 per cent. of the cost of casting a similar aluminium block. US automobile engineers believe that if they can get within 25 per cent. of the cost of the aluminium block, s.-g. iron would displace aluminium.

For example, an aluminium transmission housing weighs 19 lb., whilst its cast-iron counterpart weighs 75 lb., but the aluminium casting doesn't provide enough "dampening" and an additional 6 lb. of bolts and other tightening devices must be added. By using s.-g. iron, the casting could be reduced to 63 lb. Many foundry engineers believe that further weight reducing can be done by seeking to establish more realistic safety factors which, in some cases, they say, are 4,300 per cent. above requirements. By bringing the weight down and coupling it with cheaper production methods, it is felt that it might be possible to make iron castings in such a way that they would equal or be cheaper in cost than their aluminium counterparts.

Crankshafts and camshafts are now made in s.-g. iron in some US cars and other parts in s.-g. iron include rocker-arms, gearboxes, differential-carrier boxes. However, the big challenge remains in the casting of engine-blocks, and this is one of the major projects assigned to Chevrolet-Saginaw.

UNION SHOP STEWARDS at the Doncaster factory of International Harvester Company, Limited, accepted on October 3 a modified plan for operating the four-day week which started for 200 men on Friday, October 6. The unions feared that a splitting of the off-work days would prevent the men from claiming unemployment benefit, but the management made an offer to lay the men off on alternate weeks on Friday and the following Monday. During the other week the men will work from Monday to Thursday inclusively. The management also told the men that they would try to absorb those laid off into other departments on a rota basis.

Extensions at British Bath Company, Limited . . .

. . . Four Projects Reach Fruition Simultaneously at the Greenford Plant.

British Bath Company, Limited, a member of the Allied Ironfounders, Limited, group, has recently completed at its Greenford, Middlesex, works four extension schemes of which brief particulars are as follow:—

Amenities Block

To improve both working and off-duty conditions for the 500 employees in the factory—which produces bath castings at a rate in excess of two per min.—the firm have installed spacious new amenity facilities. These are contained in a new building*, centrally situated within the 13-acre site, and which is approached by the main works service-roadway. Rectangular in shape, it has a total floor area of 22,000 sq. ft., is of two-storey construction with a high central tower comprising two additional storeys. Accommodation is provided within the building on the ground floor for washing, lavatory and bathing equipment for the male employees (Figs. 1 and 2), together with two locker rooms, one on either side of the central washroom. One locker room is used for outdoor and the other for working clothing, etc. Provision is made for drying and airing clothing by means of hot-air from ducts below each bank of lockers. Twenty-three individual shower cubicles and three circular washing fountains are installed in the washroom, together with toilets, etc.

* The company's architects for this contract were C. W. Glover & Partners, and their contractors Marshall Andrew & Company, Limited.

Kitchen and Dining Rooms

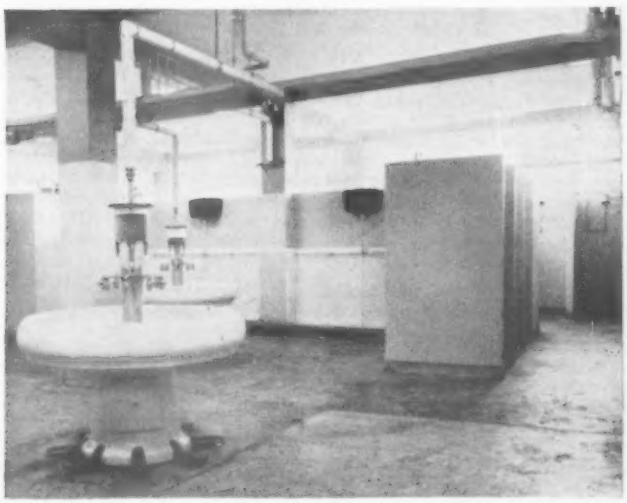
Kitchen and dining rooms are on the first floor of the new block, the works and staff dining rooms accommodating 200 and 80 respectively, at each sitting. Steel-framed stacking tables and chairs are provided; there is also a smaller dining room for senior executives. At the head of the stairs leading to the dining rooms are situated washhand basins and hot-air hand-drying equipment.

The kitchen (Fig. 3) is equipped with a combination of gas-heated cooking apparatus and stainless-steel preparation and service equipment, all designed and supplied by the catering-equipment division of Allied Ironfounders, Limited. This area also contains storage accommodation for raw materials, refrigerated items, and preparation areas for meat, vegetables and pastry, the actual cooking equipment being located in the centre. There is also a section entirely devoted to crockery washing, this being carried out by an electrically-driven machine supplied by the Hobart Manufacturing Company, who also provided machines for potato peeling, pastry making and meat slicing.

Water, Heating and Medical Services

The central tower of the building houses two 22,000-gall. cold-water storage tanks. The water

FIGS. 1 *and* 2.—*Parts of the ablution and locker accommodation, respectively, newly installed at British Bath Company's Greenford plant, where* 500 *employees are catered for.*



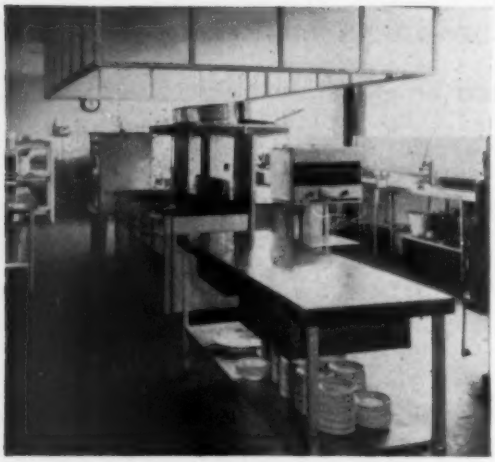


FIG. 3.—*Section of the kitchen facilities in the new amenity block, nearly all of the equipment being provided by companies within the Allied Ironfounders' group, particularly by the catering equipment division, which until recently traded under the name Falkirk Iron Company, Limited.*

for process purposes and domestic use is automatically pumped to the storage tank from the company's artesian well. Town water is also available in emergency and at drinking fountains. An oil-fired sectional hot-water boiler, rated at 1,500,000 B.T.U. per hr., is also installed within this section, with the associated hot-water storage calorifiers and the air-heating and ventilation plant.

A surgery located on the ground floor is equipped with medical and first-aid equipment, enabling the resident nursing and medical staff to give prompt attention to employees in cases of injury or sickness.

Spare-time Stores

An area for the storage of spare parts for use in the firm's mechanized plant has also been incorporated in the new building. Here, the layout has been arranged so as to provide the largest possible number of compartments, some in slotted angle shelving and bins and others in sheet-steel racks, etc. The ground-floor storage area is served by a 1-ton overhead electric travelling crane to facilitate the handling of heavy machine parts and on the first floor there is a travelling electric hoist-block also of 1-ton capacity, enabling goods to be lifted direct from transport vehicles.

Fuel-oil Storage and Distribution

As the third phase of the extension programme now reported, the company has installed additional storage tanks and automatic plant for pumping fuel-oil to their enamel melting and bath enamelling furnaces, and other process and space-heating plant. Previous storage vessels at various points were found to be unsuitably placed for the offtake of fuel oil from large road tankers. The new tanks have therefore been grouped within a concrete-walled enclosure adjacent to the site boundary. The installation comprises four 3,500-gall. cylindrical storage tanks for gas-oil and four 12,000-gall. tanks for heavier fuel oil. Consumption of the plant is in the region of 1,000 and 4,000 gall. per day respectively of the two fuels. The heavy-oil tanks are insulated and provided with heating elements to maintain fluidity of the oil during the winter months.

The fuel oil distribution plant comprises duplicate electric motor driven pumps for each grade of oil. The pumping plant circulates the oil to the service tanks feeding the enamel melting and enamelling furnaces. Oil pipelines are installed in underground ducts covered with cast-iron chequered plates. The fuel lines are also insulated and provided with electric tracer cable to ensure adequate fluidity of the heavy grade of oil during winter months. This new plant is entirely automatic in operation, and supervision is only required for visual checking and dipping the tanker vehicle when deliveries of fuel oil are made.

Metallurgical Laboratory

The fourth extension—a new metallurgical control laboratory—was opened last August. Its primary function is to control the quality of moulding sands and other materials used in the production of bath castings and to maintain high quality in the finished products. To ensure this, constant investigation of raw materials received runs parallel to continual checking of moulding-sand properties and chemical analyses of metal. Physical testing of metal and microscopic examination of metal structure also plays a prominent part in the laboratory's activities. The siting of the laboratory at the heart of the foundry and adjacent to the cupolas, permits process samples of metal and sand to be received and control action taken with a minimum of delay on the test results secured.

The laboratory is divided into various sections, *viz.*—the analytical department (where routine analyses are carried out on metal samples taken from the cupola furnace every 30 min., the carbon and sulphur being determined by Strohlein apparatus); physical-testing and metallographical departments, and sand-testing section (routine tests here include permeability, green-bond, shatter-index, moisture content and temperature). Additives for the foundry sands are also tested, and research is carried out directed to the improvement of moulding sands to suit production of bath castings.

ON SEPTEMBER 30, the assets and liabilities of Owen & Dyson, Limited, were transferred to the United Steel Companies, Limited. The business of Owen & Dyson is now being undertaken by Steel, Peech & Tozer, and the new department thus created will be known as the Fullerton machine shops.

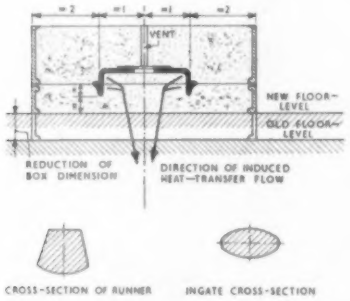
Correspondence

To the Editor of FOUNDRY TRADE JOURNAL

BRAKE-DRUM PROBLEM

SIR,—With regard to the letter from "Drummer" on the above subject published in the FOUNDRY TRADE JOURNAL dated September 21, I submit the following explanation and suggested cure for the micro-porosity experienced when machining the inner surface of brake-drums.

The problem would seem to arise from the thermo-dynamical movement of surface sand adjacent to the porous face and to the same movement of gaseous matter. Looking at "Drummer's" sketch of the moulding-box section, it will be noticed that the design of the brake-drum provides a natural trap for molecular movement. When the mould is prepared and pouring completed, the metal on the outer face will cool first, by virtue of the box design as illustrated. As this occurs, a natural barrier is set up against molecular movement in this direction and hence the molecular energy must be transferred with increased intensity on to the inner face. This will disturb the sand face and the inter movement of metal and sand will trap any gas and vapour present. The metal flowing round the less-dense but highly pressurized gas will trap the gas in micro pockets and macro seams. The design shown shows clearly that there will be cross-radial heat-resistance resulting in eddy flow.



To cure this, the following points should be given consideration: (1) Reduce the depth of the drag half and increase the depth of the cope half of the box; (2) increase side width of the box, so that heat is not so readily transferred to the sides; (3) design runners and ingates to have curved surfaces in cross-section, and (4) increase pouring time to 12 sec. The sketch above makes clear that what is required is induced heat-flow from the inner brake-drum face. To do this, pressure must be reduced in such a position that the heat-flow is away from the face in question. Regard for these points should achieve this result.

Adoption of the suggested method will cost nothing, only a change of box-parts being required, and a slight modification to runners and ingates, unless one includes the cost of an extra five sec. of pouring-time. If no improvement results, nothing is lost, but I feel certain that benefits should be apparent. Alternatively, reversing the position of the mould may give beneficial results, provided the heat-flow question receives attention.—Yours, etc.,

N. TAYLOR.

Harlow, Essex.

SIR,—My experience tells me that the micro-porosity of which your correspondent "Drummer" complains is a problem of the design of the casting *as-cast*. Such porosity seems inherent in some types of cast iron and can be developed readily in the mould.

The primary cause is the increase in section at the root of the rib, but this of itself would be insufficient to produce porosity except in a high-phosphorus iron. Other factors are present which exaggerate the effect of this thicker section; notably the shape of the runner, its closeness to the casting, and its depth in the mould. The initial pouring allows the outer faces of the casting to freeze normally but, as cooling progresses, heat-transfer is delayed between the rib area and the runner. Both areas have had the whole of the metal pass through them and also contain the last metal, *i.e.*, the hottest. The mould itself, at these points, is overheated. Heat-transference here, therefore, is required to be more rapid than elsewhere. In fact, because of the juxtaposition of casting and runner and the depth in the mould, heat dispersal here is markedly slowed down. Indeed, the collar of sand between the casting and the runner, above the rib, will build up to a higher temperature than the main body of the mould because of the retention of heat in the casting and the runner and *vice versa*. Initial cooling is not affected because of the speed of the pour, and the skin of the casting freezes normally; but poor heat-transfer at the thickest casting section will slow down cooling progressively towards its centre. Finally, a small area remains which is not completely solid but is surrounded by solid material. The resulting contraction here produces *micro* porosity, because the area is small and freezing almost complete. It would be interesting to note, to prove my point, whether those castings with smaller patches of porosity have those patches in areas between the ingates.

The obvious remedy is to disturb the conditions causing delayed heat-transfer. Very little is required to restore the balance. It can be done by adding two smaller ribs—but this may present moulding difficulties—or by dispensing with the rib altogether —which may be impracticable. The running system could be altered to avoid the fencing-in effect. Even rounding off the top of the runner or reducing its depth might be sufficient. Need the moulding boxes be so deep or the pouring temperature so high?

Having suggested a possible cause, the cure should be more apparent to your correspondent with his greater knowledge of conditions in his own foundry and the usage to which the casting is put.

Finally, I hope that "Drummer," having posed the question to your readers, will be fair to them and publish the solution arrived at. All power to his elbow.—Yours, etc.,

W. H. BOND.

Sutton Coldfield.

SIR,—In reference to the brake-drum problem outlined in the correspondence column of a recent JOURNAL, whilst we do not make brake-drums we have had similar experiences in the past and we have almost invariably condensed the issue to two factors: (*a*) Soft ramming and (*b*) the use of ferro-silicon as an inoculant.

Primarily, of course, the micro-porosity occurs because of local overheating caused by the impingement of the metal from the ingates against the "cod," which coincides with the greatest cross-sectional area of metal, and one would suggest in these circumstances that the logical approach would be to eliminate any

Correspondence

impingement. Bearing in mind, however, the probable difficulties of re-arranging the moulding method and the runners, etc., and having regard to the fact that mould hardness is likely to be less at this level in the greensand cod, it could be that mould resilience, at a point which is at the same time hottest, is responsible for the inter-dendritic shrinkage. While we should not suggest that it is an economic method of production, we should say that it is almost 100 per cent. certain that a CO_2 mould would produce sound castings, and if this is so, it indicates either (*a*), reactivity of the mould material or (*b*) a degree (possibly only slight) of soft ramming.

Your correspondent does not state whether the composition of the metal is as melted or if a ferro-silicon spout addition is made. If the latter, it is quite a likely source of micro-porosity, as we have found on many occasions, and a graphite-nuclei count in the affected area compared with a sound section would then help to eliminate the defect. Hot spots which cannot be fed are a "breeding ground" for the nuclei and tend to exacerbate the shrinkage proneness to which inoculated irons are susceptible.

Perhaps you would pass our comments along to your correspondent whom, we trust, has met with a satisfactory response to his letter.—Yours, etc.

S. CARTER.

Huddersfield.

SIR,—In answer to your reader's problem of the brake-drum in your issue of September 21, I offer the following as an improvement on his method:—

The ingates in the drawing indicate that the flow of metal runs directly or at right angles to the face of the greensand core which could possibly cause deterioration of this area of the sand, thus causing porosity in the casting. If the gates were run into the mould at an angle as shown in my sketch*, tapering at the same time, then it may eliminate porosity. —Yours, etc.,

J. W. SCOTT.

Windsor.

* Mr. Scott's sketches show the substitution of tangential ingates tapering from $\frac{3}{8}$ to $\frac{1}{2}$ in. (of the same thickness of those of "Drummer")—EDITOR.

On behalf of "Drummer," the Editor thanks the several correspondents who have replied to this query with suggestions, and others who have offered direct help. Replies were sent to the foundryman who sent the problem and his pronouncements on the efficacy of the remedies put forward are now awaited—EDITOR.

STEAM CHESTS

SIR,—As a one-time prominent pioneer in the design art of "castability" may I offer my congratulations on your featuring in the September 14 issue the "Interesting Castings Operations by Armstrong Whitworth (Metal Industries)" relating to "Steam Chests for CEGB's* West Thurrock Power-station" supplied to AEI, Limited. As the original chairman of the AEI "Castability Committee," and speaker thereon at several BSFA Customer/Founder Conventions, may I say, "I couldn'a done better mysen."—Yours, etc.

A. C. ANNIS

Manchester, 14.

* These letters should have been interpreted in the original article as representing: Central Electricity Generating Board—EDITOR.

Hungarian Foundry Technology

The September issue of the Hungarian foundry journal, *Ontode*, contains full-length contributions by F. Varga (on the effect of slag on the properties of cast iron) and by L. Hedai (on sodium-silicate-bonded sands).

In the former article, it is stated that laboratory experiments have shown that a change in the composition of the slag causes at first an immediate change in the composition of the liquid iron, *viz.* decrease of the slag basicity can decrease the carbon-saturation value and, in consequence, it may be the factor responsible for the improvement of the mechanical properties of the cast iron. A change can also be observed on the size and number of the graphite lamellae. When the slag volume increases, the carbon-saturation value increases and, with this, a worsening of the mechanical properties occurs. A protraction of the superheating period has similar effect.

Mr. Hedai, in his article, describes sand mixtures used in the sodium-silicate moulding process, saying that these may be of two types, those which possess greenstrength or are without it. This paper studies, in detail, the effect of auxiliary materials used for decreasing the strength of CO_2/silicate sands at the knock-out (silica flour, chamotte, plumbago, sawdust, burnt-out clay, dextrin and sulphite lye) their effect on the properties of the mixture, and also discusses the behaviour of the mixtures at high temperatures and their thermal-expansion characteristics.

House Organs

The Stantonian, Vol. 22, No. 8. Issued by Stanton Ironworks Company, Limited, near Nottingham.

This issue describes the opening ceremony of the new plant of Stanton Pipes (Canada), Limited, at Hamilton, Ontario, by the Hon. Ellen H. Fairclough, Canadian Minister of Citizenship and Immigration. Mr. A. P. Shearwood, chairman and president of the National Steel Car Corporation, Limited, and a director of the new concern, presided at the ceremony. From the Nottingham company there were present the managing director, Mr. N. C. Macdiarmid, who is also chairman of Stanton Pipes (Canada), Mr. L. Rawlins and Mr. C. H. Wilson. Another article in the magazine covers the eleventh annual parents day, and also recorded are the social and sporting activities of the various sections of the works.

Inco-Magazine, No. 18. Issued by the International Nickel Company (Mond), Limited, Thames House, Millbank, London, S.W.1.

The reviewer was impressed with four articles appearing in this issue. The first, beautifully illustrated, tells of the use of rhodium plating on silver ware, which whilst it eliminates tarnishing and periodical cleaning, enhances the appearance of the silver and does not detract from its value. An application detailed for Ni-hard cast iron is use of castings of this material for blades on the shaft of log-washers—in the case covered in the magazine the log-washer is shown engaged in the processing of gravel. Another article on the S.S. Canberra gives an excellent description of the ship, with special reference to those components incorporating nickel. Finally, "Taking the Roll out of Sea Travel," tells just how stabilizers operate.

AFS Training and Research Centre

Plans aimed at solving three of the foundry industry's major problems have been approved at its annual meeting by the board of directors of the American Foundrymen's Society. The three problems are: inadequate retraining facilities in modern techniques for technical and supervisory personnel, a need for a greatly expanded centralized training programme for approximately 200,000 who are expected to enter the foundry industry in the next 25 years, and lack of centralized administration and facilities for research.

The plan of the AFS provides for construction of an industry-sponsored Training and Research Centre on land given by the Society adjacent to its headquarters in Des Plaines. Architectural plans for the building, which will cost $600,000, have already been completed.

The administration of the AFS Training and Research Institute will be by a fully tax-free foundation under the guidance of seven trustees. The building will have approximately 19,000 sq. ft. of floor space, including research, practical training, and classroom facilities. Conceived by the foundry industry itself, the new building will remove the present limitations on the scope of AFS training and research activities.

Training Courses

Several years ago the AFS set up a series of training courses on a "pilot" basis, but this programme had been unable to keep up with the growing needs and demands of the metal castings industry. At the present time, it is estimated a minimum of 6,000 per year require training or retraining. With no up-to-date practical foundry training courses available in educational institutions, enrolment by foundries of their personnel in these courses has grown rapidly. Already some 2,000 from over 750 companies have been trained, using temporary facilities here and there. During the past three years alone the Society has conducted some 60 two-to-five day courses to assist the industry. Attendance this year will total approximately 520 from 280 companies.

Most of the "pilot" work has been in the nature of retraining of existing foundry personnel: training of new graduate engineers in foundry practice is also badly needed. The new centre will provide the facility for both types of individuals through intensive training in small groups. The completion of the building would also forward the installation of such training equipment, already offered to the Society, as a complete sand laboratory and the entire present foundry laboratory of Northwestern University. How important this proposed centre is to the foundry industry is shown by unsolicited contributions of over $35,000 already received from industry for this facility. In addition, the establishment of the AFS Training and Research Institute as an independent foundation, will permit major expansion of basic research activities in behalf of the castings industry.

The board of directors has already authorized a new class of membership in the AFS—research patrons—whose dues would largely be devoted to implementing research programmes in behalf of the industry, in addition to industry's own contributions to the Foundation. Currently the AFS has—either already underway or about to be launched—some 12 basic research projects embracing all types of metals used in castings, plus basic research in techniques of both gravity and pressure-die-casting, heat-transfer, shell moulding and sand casting.

Film Review

Smiths make News. 16-mm., colour, produced by Mottershaw Commercial Films, Limited, for Thomas Smith & Sons (Rodley), Limited; running time 20 min.

A Press-preview of a new industrial film was held on Thursday, September 21, at Colour Film Services, Limited, London. The film, entitled "Smiths make News" was produced for Thomas Smith & Sons (Rodley), Limited, manufacturers of mechanical-handling equipment since 1820. To-day, the company (one of the Thos. W. Ward Group of companies) is represented in 70 overseas countries and about 50 per cent. of their production of cranes and excavators is exported every year. The film, which was made to show the extent and capacity of the company's wide range of equipment, tells the story of a local newspaper reporter who is writing-up slum-demolition and rehabilitation schemes in Sheffield. The film follows the reporter as he traces the schemes and, at every point in the story, one of the company's machines is shown in action. In this way, the full range of the firm's manufactures is seen at work under typical conditions. The colour photography was exceedingly pleasant and there was a nice sense of the dramatic shown in selecting the shots of machines at work.

Industrial organizations or secretaries of groups who would like to see the film are asked to communicate with the publicity manager, Thomas Smith & Sons (Rodley), Limited, Rodley, near Leeds. In the meantime, more than 20 provincial showings are being arranged at centres throughout the country and other copies are being sent to various overseas countries, "dubbed" with the appropriate language.

Nationalization Threats

Labour would renationalize the steel industry and would have a stake in the manufacture of machine-tools by perhaps taking over large firms, said Mr. R. H. S. Crossman, chairman of the Labour Party, when he discussed "Signposts for the Sixties," at the East Midland regional conference of the Labour Party in Nottingham. He said that every big business to-day was concentrating more and more power in irresponsible hands, and the big combines were more powerful than the Government. "This is why we have to extend the area of public ownership but we do not want to take over old and dying industries. In the past we have taken on some that were virtually bankrupt. We want new and growing ones." Mr. Crossman said that the Common Market issue could bring about an early General Election and the time had never been more opportune for Labour to state its case.

"Profit by Handling"

Organized by the materials handling group of the Institution of Production Engineers in conjunction with the Institute of Materials Handling, the 1961 Materials Handling Convention will have as its theme "Profit by Handling." The convention, to be held at the Connaught Rooms, London, W.C.2, on November 3 and 4, will study the methods and administration of handling materials from source to consumer with a view to lower costs. Included in the programme is a film lecture on "Rail Transport and Materials Handling"; a lecture on "Cargo Handling by Mechanical Means," and "Mass-production Handling." Applications to attend should be made to the Conference Secretary, Institution of Production Engineers, 10, Chesterfield Street, Mayfair, London, W.1.

Personal

Dr. J. W. MENTER has been appointed director of the research laboratory of Tube Investments, Limited, at Hinxton Hall, near Cambridge.

Mr. R. A. G. DUFF, Mr. R. H. FOSTER, Mr. A. G. GILBERTSON and Mr. G. B. G. POTTER have been appointed additional directors of N. Hingley & Sons, Limited.

The Kennecott Copper Corporation announce the appointment of Mr. CHARLES D. MICHAELSON as vice-president, mining, and Mr. GORDON B. RUSSELL as treasurer and comptroller.

Mr. WILLIAM H. RIGG has been appointed managing director of Firth Cleveland Tools, Limited, a member of the Firth Cleveland group. He will operate from the company's Tipton works in Staffordshire.

Dr. A. CARESS is to become research and development director of Imperial Chemical Industries, Limited, from December 1. This appointment is in addition to his present appointment as an overseas director.

Presentation of a gold watch was made to Mr. JOHN S. MITCHELL, head of the costing and wages department of Smith & Wellstood, Limited, Bonnybridge Foundry, on his leaving after 22 years' service to take up an appointment with another firm.

Mr. G. W. GIFFIN, director of manufacture on the board of Associated Electrical Industries (Woolwich), Limited, has retired after a 2-year association with the company. Mr. J. LAND has been appointed divisional chief estimator of the AEI switchgear division.

Sir JOHN DEAN has retired from the board of British Insulated Callender's Cables, Limited, and certain subsidiaries, to devote more time to the chairmanship of Submarine Cables, Limited, in which Associated Electrical Industries, Limited, with BICC, have 50 per cent. interests.

Mr. AUSTIN W. SCOTT has been appointed to the board of Armstrong Whitworth (Metal Industries), Limited. Mr. Scott joined the company in 1949 and will retain the position he has held for the past two years as works manager of the Jarrow Foundry Division.

Mr. T. B. MARSHALL has retired from the board of Frederick Braby & Company, Limited, on medical advice, after 47 years with the company. Mr. E. LUXMOORE, Mr. S. W. PENWILL and Mr. D. SHEPHERD have been appointed additional directors of the Newrith group.

Mr. B. C. CAMMELL has retired from the lawnmower sales department of Ransomes, Sims & Jeffries, Limited, Orwell Works, Ipswich. He was presented with a transistor radio set and a cheque from employees of the firm, which was given to him by Mr. W. D. Akestar, a director.

Miss B. P. PARK, who has been appointed sales manager of the eye protection department of Pyrene-Panorama, Limited, Windmill Road, Brentford, Middlesex, has specialized for many years in industrial eye protection and has also served on a number of local and national committees.

At a meeting of the Court of Assistants held the week before last, the Worshipful Company of Founders elected Mr. ERNEST WILLIAM MOSS, M.I.MECH.E., M.I.E.E., F.C.S., as Master. Mr. Harvey B. Young, M.I.C.E., M.I.MECH.E., and Dr. J. G. Pearce, C.B.E., were elected upper and under wardens respectively.

Mr. T. WINSPER, works director of J. A. Phillips & Company, Limited, Smethwick, retired on September 30. He joined the firm in 1922 became successively chargehand, foreman, manager, works manager and was appointed to the board in 1951. For his work on war production he was awarded the M.B.E. He is this year's president of Smethwick Rotary Club.

MR. E. E. BULLEN, the finance director of Shell Chemical Company, Limited, retired on September 30. He is succeeded by MR. W. F. TUSON, who will be known as director, finance and economics. MR. A. N. HOLMES becomes general manager, plastics and rubber division. He succeeds MR. W. J. GAVIN who as a director of Shell Chemicals will be undertaking new responsibilities within the company.

Mr. K. G. SMITH has been appointed deputy secretary of the General Electric Company, Limited. He continues as GEC pension fund secretary and investment manager. Mr. N. POYNER, formerly deputy financial controller of the viscose division of Courtaulds, Limited, has been appointed chief cost accountant to General Electric. By arrangement with Courtaulds, he has already taken up his new duties.

Mr. G. C. D'ARCY has been elected chairman of the Fairey Company, Limited, as part of the company's reorganization of board responsibilities. Mr. G. W. HALL remains a director of the company as well as being chairman of Avions Fairey S.A. He is also vice-president of the Fairey Aviation Company of Canada. Mr. RAYMOND E. PURVES, chairman of the company's Australasian subsidiary, has been invited to join the board.

THE DUKE OF EDINBURGH will visit Sheffield and Rotherham on November 2 in place of a visit which was prevented in July by a polo accident to the Duke. The visit will include the opening of the Rotherham College of Technology, a luncheon in his honour at Sheffield University, given by the Chancellor of the University, the Rt. Hon. R. A. Butler, and a visit to the new department of fuel engineering of the university.

Mr. A. BOND, deputy chairman of the Yorkshire Electricity Board, has been appointed chairman by the Minister of Power, from February 25, 1962, in succession to Mr. D. BELLAMY, who retires. Mr. Bond has been deputy chairman since February 1952. Mr. R. H. M. BARKHAM, chief commercial officer of the Eastern Electricity Board since 1955, has been appointed deputy chairman of the Yorkshire Electricity Board to succeed Mr. Bellamy from February, 1962.

After serving Albion Motors, Limited, of Glasgow, for 51 years Mr. H. J. CAMPLIN has relinquished his position as a director of the company. He joined the London staff of Albion Motors in 1910, later going to Southampton and then to Bristol. In 1946, he became London area manager, and in 1954 was appointed to the board of Albion; after integration of Albion and Leyland Motors, Limited, he became the group's southern divisional manager. He received a chairside cabinet in recognition of his services.

For the first time in eight years a girl has attended a special course sponsored by the United Steel Companies, Limited. She is Miss MARY DOWNEY, a second-year metallurgy student at King's College, Newcastle, and "to mark her bravery in attending the course as the only girl" Mr. Ronald Bavister, director and commercial manager of Samuel Fox & Company, Limited, has presented her with an umbrella. She was among the 40 undergraduates, from universities all over the country, who attended the course this year. During the week, they visited steelworks as well as attending lectures and discussions.

Presentation to A. S. Wall

At the Windsor Hotel, Cardiff, a representative gathering of the members of the Wales and Monmouth branch of the Institute of British Foundrymen attended a dinner on Thursday, September 28, to mark the retirement of A. S. Wall from the position of branch secretary. Mr. Wall became secretary of the branch in 1941 and after guiding it through the difficult war years he continued to serve in this capacity until 1960 when he was elevated to the presidency of the branch.

Mr. A. S. Wall (right) receiving his presentation from Mr. G. Lambert, IBF secretary. Mr. H. E. Williams, branch president (centre) joins in the congratulations.

The present branch president, Mr. H. E. Williams, opened the proceedings with a very warm tribute in which he mentioned that throughout his 20 years' service as secretary Mr. Wall had never missed a branch meeting. The secretary of the Institute, Mr. G. Lambert, then presented him with a chiming clock and cheque, subscribed for by members of the branch as a token of their appreciation of Mr. Wall's sterling work on their behalf. Mr. R. J. Richardson, O.B.E., speaking for the members of the branch, concluded the formal tributes to Mr. Wall who, however, continued to receive informal honours throughout the evening. Mr. Wall, in a sparkling reply, stated that he had found the whole 20 years' of service as branch secretary both enjoyable and highly rewarding.

POA Election of Officers

Newly-elected president of the Purchasing Officers' Association, 1961-62, is Mr. C. Russell of Turners Asbestos Cement Company, Limited. Mr. J. M. Grammer (National Coal Board) becomes executive vice-president, and other vice-presidents are Mr. R. G. H. Dennis (British Xylonite Company, Limited), Mr. R. C. Jacobs (Bristol Commercial Vehicles, Limited), Mr. G. M. Masson (A. Revrolle & Company, Limited), Mr. H. F. Scudder (G. A. Harvey & Company (London), Limited), and Mr. C. W. Thompson (Organon Laboratories, Limited). Mr. A. N. Maier (London Brick Company, Limited) has been elected chairman, Mr. I. Faulkner (L. H. Newton & Company, Limited) vice-chairman, and Mr. E. C. T. Humberstone (Hawker Aircraft, Limited), hon. treasurer.

New Members of DSIR Research Council

Lord Hailsham, Minister for Science, has appointed five new members of the Council for Scientific and Industrial Research. They are Mr. L. H. Bedford, director of engineering, guided weapons division, English Electric Aviation, Limited; Mr. G. B. R. Feilden, FRS, managing director, Hawker Siddeley Brush Turbines, Limited; Prof. E. R. H. Jones, FRS, Waynflete Professor of Chemistry, Oxford University; Prof. O. A. Saunders, FRS, Professor of Mechanical Engineering, Imperial College, London; and Mr. H. C. Tett, chairman and managing director, Esso Petroleum Company, Limited.

Three members who have completed their five-year term of office retired on September 30. They are the former chairman, Sir Harry Jephcott, chairman of Glaxo Laboratories, Limited; Prof. C. E. H. Bawn, FRS, Professor of Inorganic and Physical Chemistry, Liverpool University; and Sir Willis Jackson, FRS, until recently director of research and education, A.E.I. (Manchester), Limited.

Sheepbridge closes down Blast Furnaces

The Sheepbridge Company, Limited, last week announced its decision to close down its blast furnaces until further notice. Over 500 employees will be affected and the trade unions principally concerned have been advised. This step has been forced on the company by rising stocks accompanied by the decline in demand for basic pig-iron from the steel industry which has, for a number of years, been the company's principal customer.

In recent years integrated steel plants have progressively increased their own basic-iron production. This trend, combined with the present decline in steel production, has very substantially reduced steelmakers' purchases of cold basic iron from merchant producers such as Sheepbridge. The company hopes to be able to continue production until November 17, and will offer employees every opportunity to find suitable alternative employment. The company's other activities remain unaffected.

United Steel Scholarships

The United Steel Companies, Limited, have awarded five university scholarships, following a final selection board held in Sheffield, at which a short list of 20 candidates was interviewed out of a total of 201 applicants.

The scholarships are tenable for three or four years and are to the value of £500 per annum, free of tax. It is intended that they should provide industrial as well as academic training, and arrangements will be made for the successful candidates to receive industrial experience with the company. This is the second annual award of United Steel scholarships: five were awarded in 1960. The successful candidates were:—Mr. J. S. Briggs (Thornes House School, Wakefield); Mr. B. Cheetham (King Edward VII School, Sheffield); Mr. R. A. Herbertson (Magdalen College School, Oxford); Mr. L. M. Jones (Oswestry High School for Boys); and Mr. R. M. Sainsbury (Sherborne School). Mr. Briggs goes to Manchester University, Mr. Jones to Trinity College, Cambridge, and the other three to Corpus Christi College, Oxford.

Publications Received

Use of Town Gas in the Foundry (Modern Foundry Practice). Issued by the Gas Council and available through the Area Boards.

This brochure is alike interesting and informative. The use of fuel enters into many phases of foundry practice and the objective of this publication is to draw attention to the potentialities of town gas for each of these, the number being surprisingly large. The publication starts off with sand drying, and describes and illustrates a machine of the rotary type employed for this purpose. Mould-drying plant assumes several forms and includes several burners and portable heaters. This section is followed by one covering stove drying of cores and moulds, including a unit for drying the cores after blacking. A little over a page is devoted to shell moulding and dewaxing and firing investment moulds. On the melting side, such questions as cupola lighting and blast heating are covered, in addition to ladle drying and heating. Here the publishers have drawn on steelworks for some of their illustrations, but to no detriment. Heat-treatment of iron and steel castings, the melting of non-ferrous metals, the heating of dies for die-casting and the superheating of liquid cast iron in a gas-fired receiver are followed by a mention of new rapid-melting techniques employing gas. Stove and vitreous enamelling, the use of gas for water-heating in amenity blocks and for space-heating conclude this comprehensive survey. The 32 illustrations in the brochure of plant and processes are for the most part comprised of photographs taken in well-known foundries. Good use of colour printing serves to make this a really useful addition to foundry trade literature, and the list of addresses of gas industry Area Boards printed on the back cover—all offering free technical advice—leave founders with no excuse for not exploring the potentialities of the fuel.

Annual Report, 1960-61. Published by the British Standards Institution, 2, Park Street, London, W.1; price 7s. 6d.

During the year under review, the British Standards Institution reports that there was an increase of 51 in the number of firms licensed to use the "Kite" mark—they now number 1,498. The book records the growth of international co-operation in standardization of products, symbols used in various fields, etc., and over 40 pages are devoted to these activities. The major portion of the report is taken up, as usual, with divisional reports.

European Investment Casters' Association—Proceedings of the 1960 Conference, held at Liège, July 4 to 6.

The Proceedings* of the 1960 conference of the European Investment Casters' Association are now to hand and have been circulated to members by its president, Mr. H. J. Meerkamp van Embden, Philips Research Laboratories, Eindhoven, Holland. The 180-page volume is in mimeographed form and the papers are published in each author's language. The publication opens with a list of participants attending the conference and follows with a résumé of the programme arrangements.

The following papers are included in full: "Specifications for the Investment-casting Industry in the U.K.," by L. S. Taylor (in English); "Alloy Specifications for German Investment Casters," by K. A. Krekeler (in German); "Multi-point Immersion Pyrometer with Temperature Recorder," by F. Faus (in French); "Influence of Castings Methods on the properties of High-temperature Alloys," by W. Tofaute and U. Gravenhorst (in German); "Experiences of Investment Casting in Vacuum," by L. S. Taylor (in English); "Investment Casting in America, 1960," by R. F. Waindle (in English); "Influence of Test-bar Design on the Mechanical Properties of Two Cast High-temperature Alloys," by R. M. Cook and P. J. Penrice (in English); and "Effect of Composition and Heat-treatment on the Impact Resistance of Some Plain-carbon, Investment-cast Steels," by P. Mathy (in French).

* The conference was reported fully in this JOURNAL, September 1, 1960, and synopses of the papers were included.

The Iron Foundry, Distington. Published by the Distington Engineering Company, Limited (a branch of the United Steel Companies, Limited).

This colourful 32-page brochure describes the manufacturing facilities which the Distington Engineering Company possesses for making castings for iron- and steel-works' plant. Ingot moulds, slag moulds, and bottom-plates are turned out in such quantities that at 2,800 tons per week the company's foundry is said to be the largest producing centre for such castings in Europe. Since its re-establishment in 1946, the output of this foundry has had a profound influence on the statistical position for the UK production of castings in the various regional areas. The brochure describes in detail all the processes operated, from the melting of the metal to cleaning and machining the castings, and a description of the patternshop is also included. The methods used for ensuring proper technical control make interesting reading and show just how many factors are involved. Recipients of this beautiful brochure can indeed count themselves fortunate.

Further Trading Opportunities in Europe. Published by the Export Council for Europe, 31, Tothill Street, London, S.W.1; price 5s.

This issue covers trading opportunities in Belgium and Luxembourg, Finland, Greece, Ireland, the Netherlands and Turkey, in the form of reports by members of the Export Council for Europe who have been on trade missions in these countries. In an introductory paragraph, Sir William McFadzean, the chairman, says, "It is much too widely accepted in Europe that we are living on traditions" and he suggests that a far better "image of Britain" must be projected. The reviewer's tours in well over a dozen European countries certainly do not confirm that such a view is correct as related to the foundry or iron and steel industries in the countries visited. This book is really Part III, earlier sections having covered the rest of Europe. Taken as a whole the reports are full of down-to-earth observations and intelligent advice, and are well worth the price asked for them.

Foseco Foundry Practice, No. 148. Issued by Foseco, Limited, Drayton Manor, Tamworth, Staffs.

The problem dealt with in this issue is a shrinkage defect in an aluminium-alloy gravity-die-casting. The findings make interesting reading as the defect was diagnosed by visual examination. A useful and simple mould clamp is also described and illustrated.

BRITISH TRANSPORT COMMISSION have placed a contract with William Moss & Sons, Limited, of Loughborough, Leicestershire, for construction of the buildings for British Railways' £1,350,000 engineering laboratories and research department headquarters in London Road, Derby. Work is about to begin and will take about two years.

News in Brief

THE JOURNAL acknowledges, with thanks, Michaelmas greetings from Head, Wrightson & Company, Limited.

THE BRITISH IRON & STEEL FEDERATION'S safety film, "Hazard," has been awarded the Turin Film Festival's premier award for the best entry in 1961.

UGANDA'S SOROTI-LIRA RAILWAY is to be extended to the east bank of the Nile at Pakwach. The possibility of a further extension across the Nile will also be examined.

THE ADDRESS of the Manchester office and warehouse of the Norton Grinding Wheel Company, Limited, is now Wharf Road, Sale, Cheshire ('phone: Sale 8285/7).

A FULLY-AUTOMATIC domestic oil-fired boiler made by Newton Chambers & Company, Limited, Thorncliffe, Sheffield, has won a gold medal at the California State Fair in Sacramento.

THE BRITISH INDUSTRIAL TRUCK ASSOCIATION, York Mansion, 94-98, Petty France, London, S.W.1, have issued a booklet covering "Fork Truck Stability Tests"; it costs 2s. 6d. per copy.

THOS. FIRTH & JOHN BROWN, LIMITED, Sheffield, are planning to replace their existing Brown-Firth Research Laboratories at a cost of £500,000 on a site in Blackmore Street opposite the present buildings.

ON OCTOBER 25, at 1 p.m., the telephone number of the A.P.V. Company, Limited, and A.P.V.-Paramount, Limited, will be changed to Crawley 27777 when Crawley's telephone service becomes automatic.

SUFFOLK IRON FOUNDRY (1920), LIMITED, of Stowmarket, has received an order from the Government of Cuba for 2½ tons of brazing rods to a value of £2,500. The company has also received a £350 order from Bolivia.

A DIFFERENCE of ¼ in. between grate bars, provided for in the first smoke-control order which comes into force next year, will cost the Thornaby Council £245 for conversion and supply of new grates in Council houses.

THE EARLY RECEIPT of a 1962 diary is acknowledged, with thanks, from F. & M. Supplies, Limited. As already dates are being fixed for conferences, exhibitions, etc., to be held next year, the receipt of a diary in such good time is most useful.

A NEW ORDER from the Motokov Foreign Trading Corporation, of Prague, brings to a total of more than £100,000 the value of motor cycles bought by Czechoslovakia from Norton Motors, Limited, Birmingham, during the past three years.

GOODYEAR TYRE & RUBBER COMPANY (GREAT BRITAIN), LIMITED, announce, as part of their industrial products division decentralization programme, the opening of a new sales office at 24, Broughton Street, Manchester, 8 ('phone: Deansgate 7921).

CRANE, LIMITED, has acquired the whole of the issued capital of Haven Die Castings, Limited, Newhaven, Sussex. It is the intention to continue and develop the business as a separate division of Crane, Limited, under the trading style of Tylors-Haven Die Castings (Division of Crane, Limited).

A 1919 LEYLAND R.A.F.-type van entered by Christmas, Chivers, Limited, of Cambridge, was the outright winner of the recent rally of the Historical Commercial Vehicle Club at Basildon, Essex. An Albion 20-seater coach of 1935 manufacture entered by D. & F. Rowles, of London, gained first place in the class for buses and coaches.

A 30-YEAR-OLD BURRELL STEAM ENGINE, completely rebuilt and restored to what is believed to be its original condition, took part in the annual veteran and vintage car and motor-cycle courtesy rally in Leeds on September 24. The engine was originally used for general haulage on fairgrounds and is now owned by Mr. T. O. Hunt.

THREE SPECIAL TRAINS are leaving Stanton Ironworks Company, Limited, near Nottingham, each week until the end of the year to fulfil the order of 17,000 tons of pre-stressed concrete pipes for the Bristol Waterworks Company's Sharpness Abstraction Scheme. Each train has 55 wagons and each wagon carries two pipes.

A BUTANE-GAS STORAGE PLANT, believed to be the largest in Britain, has been transported by road from Leeds to Scunthorpe for installation by the East Midlands Gas Board. Its diversionary route took it 150 miles through Newark and Lincoln instead of the normal 50-mile direct road. The plant is 65-ft. long, 14-ft. high and weighs 35 tons.

AT THE ANNUAL AMBULANCE COMPETITIONS of the English Steel Corporation, Limited, held at the River Dons Works, Sheffield, on September 23, teams from the works at River Don, Grimesthorpe, Stevenson Road, Cyclops, Holme Lane and Thorpe took part. Judges were the works medical officer, Dr. D. M. F. English and Dr. John Flynn.

A CONTRACT for the supply of approximately 11 miles of 27-in. and 30-in. dia. prestressed-concrete pressure-pipes and fittings has been awarded to Stanton and Staveley Sales, Limited, near Nottingham, by the Medway Water Board. Valued at approximately £259,000, the order is for trunk mains in connection with the Belmont water-supply scheme.

A 59-YEAR-OLD FOUNDRY LABOURER, Mr. William Mulvaney, was taken to Sheffield Royal Infirmary on September 20 after a pan of moulding material had fallen on his hand at the Grimesthorpe works of the English Steel Corporation, Limited, while he was working under a travelling crane. He was detained at hospital with a suspected fracture of the left hand.

Mr. T. E. STEEL, company secretary, Ransome & Marles Bearing Company, Limited, Newark, opened the firm's annual horticultural and flower show at Newark on September 23, and Mrs. Steel presented the trophies and awards. There were 658 entries. The grindery department won the Smallholder blue ribbon for the best fruit, flowers and vegetables.

SIX TRAINS totalling 64 coaches will arrive at the Killamarsh works of Thos. W. Ward, Limited, Sheffield, over the next month to be scrapped. Each coach weighs about 25 tons and is expected to yield about 23 tons of scrap metal. The firm is also to demolish 11 electric locomotives which were used by London Transport on outer suburban lines. They weigh about 42 tons each.

ORDERS FOR FURNACES to a value of approximately £70,000 recently obtained by Efco (Sth. Africa) (Pty), Limited, cover an electrically heated close-quench furnace, a pit-type gas-carburizing furnace, a continuous-mesh belt-conveyor furnace and two bogie-hearth furnaces each rated at 750 kw. The bogie-hearth furnaces are to be supplied to South African Railways.

HENRY SYKES, LIMITED, of London, have appointed Scottish Land Development Corporation as agents for their pumps and other equipment, in Scotland and the four northern counties. There will be three main service centres—Glasgow, Fife and Newcastle, and Mr. A. K. G. Gilbertson, who is located at the Fife depot, is responsible for the over-all operation of the agency.

News in Brief

ONE QUARTER OF THE 4,000 EMPLOYEES at the engineering works of Ransome & Marles, Limited, at Newark, Nottinghamshire, had been inoculated against influenza by the end of September. The scheme was introduced four years ago and an increasing number of employees volunteer each year. The firm has found that absenteeism amongst those inoculated is cut by half.

A NEW TYPE OF PLANT for distilling fresh water from the sea, developed by G. & J. Weir, Limited, Glasgow, has been installed for the first time in a Shaw Savill liner, the new Northern Star, now fitting out at the Tyneside yard of Vickers-Armstrong, Limited. The plant was prefabricated in sections at the yard of Charles Connell & Company, Limited, Glasgow.

FROM BRITISH GUIANA, Barclays Bank D.C.O. reports that during July, 95,151 tons of bauxite and 15,302 tons of alumina were shipped by the Demerara Bauxite Company, Limited, and went forward in 27 vessels from the port of Mackenzie, Demerara River. The total shipments by the company for the first seven months of the year were: bauxite 873,205 tons, alumina 46,723 tons.

THE MINISTER OF FUEL AND POWER, the Rt. Hon. Richard Wood, M.P., will open the Northern Exhibition of Fuel and Power for Industry at the vast, new Queens Hall, Leeds, on October 18 at 12 noon. A daily programme of films, lectures and discussions, under the auspices of the various official bodies who are supporting the exhibition will be held in the Conference Theatre attached to the hall.

A VOLUNTARY CUT in copper-mine production of 10 per cent., and slightly lower copper prices this year, have resulted in the first seven months' mineral production in Northern Rhodesia in 1961 being worth £10,000,000 less than in 1960. During July, total production was worth £10,235,858, a little less than in June. The seven months totalled £69,047,832, compared with the 1960 value of £79,157,818.

Mr. R. W. GAYTHORPE, chief maintenance engineer, Thos. W. Ward & Sons, Limited, Sheffield, presented a cheque for £20 on behalf of the firm's Angling Club to the *Sheffield Telegraph* and *The Star* Old Folks' Fund on the club's prize night on September 27. The T.W. Ward Cup was presented to Mr. William Allot, the club secretary. Prizes to a total of £130 were distributed after a very successful season.

A NEW MECHANICAL ENGINEERING BLOCK has been completed at the University of Leeds at a cost of £525,000, and enables the annual admission of students to be raised from 55 to 90. When fully in use 300 students, including research workers, will be housed in the new building. It is expected that £250,000 will have been spent on equipment, which includes two large lecture theatres, one seating 180 and the other 300.

CONTRACTS for two more County-class guided-missile destroyers, bringing the number of these ships in the Royal Navy to six by 1965, have been placed on the Clyde and the Tyne. The ships will cost about £7,000,000 each. One is to be built by the Fairfield Shipbuilding & Engineering Company, Limited, Glasgow, and the other by Vickers-Armstrong, Limited, Newcastle. They will take about four years to complete.

WESTINGHOUSE BRAKE & SIGNAL COMPANY, LIMITED, have secured contracts worth £617,000 from British Railways, North Eastern Region, covering technical equipment for the new mechanized marshalling yard at Healey Mills, near Wakefield. British Insulated Callender's Cables, Limited, will supply 50 miles of multi-core cable and 15 miles of two-core power cable for use in connection with the installation of technical equipment.

Obituary

W. S. GRAINGER

Only a few days before his death last Thursday, Mr. Walter S. Grainger took the chair as president of the Institute of Vitreous Enamellers at the annual dinner held at the City Livery Club, London. It was then obvious to his many friends that he was very frail and that he must have made a very serious effort to make the journey from his home at Sidmouth. Mr. Grainger had spent the whole of his life in the vitreous enamelling industry and he was a founder member of the Institute and of the employers' association, both of which he gave many years of outstanding service. For the former he acted as honorary treasurer from its inception to the time he was elevated to the chair. He sold his vitreous enamelling works about 18 months ago and retired from active business, but he retained his position on the boards of four companies in the brass-foundry and hollow-ware trades. Throughout his life he attached great importance to the duties to be associated with public office as was exemplified in his great effort to preside over his last luncheon.

T. P. COLCLOUGH

Dr. Tom Peach Colclough, technical adviser to the British Iron and Steel Federation since 1945, has died aged 76. Educated at Manchester and Sheffield Universities, Dr. Colclough entered the steel industry in 1916 when he became chief chemist at the Brown-Firth laboratories in Sheffield under the late Dr. Hatfield. He joined the Park Gate Iron & Steel Company, Limited, in 1920, and was successively during the next nine years, chief chemist, chief metallurgist, open-hearth manager and technical officer. From 1942 to 1945 he acted as technical adviser to the Iron and Steel Control of the Ministry of Supply, and after the war acted in a similar capacity on many important commissions abroad. For his work during the war he was made a CBE in 1947. He held the highest award of the Iron and Steel Institute —the Bessemer Gold Medal—and in May last was appointed on honorary vice-president of the Institute. He was awarded the D.Sc. by Manchester University, the M.Met. by Sheffield in 1937 and the D.Met. by the same University in 1959. He was appointed a Council member of the British Iron and Steel Research Association in 1950.

The death is announced of Mr. DAVID M. MOORE, who in 1916 established the firm of D. M. Moore & Sons, Limited, engineers, millwrights, iron and brass founders, originally in Railway Road, Coleraine, and now in Brook Street.

The death has occurred of Mr. JAMES C. RENNY, retired foreman engineer with Anderson, Boyes & Company, Limited, mining machinery manufacturers. He joined the firm in 1905 and retired in 1955. He took an active part in the firm's works welfare schemes and was a founder member and chairman of the benevolent fund.

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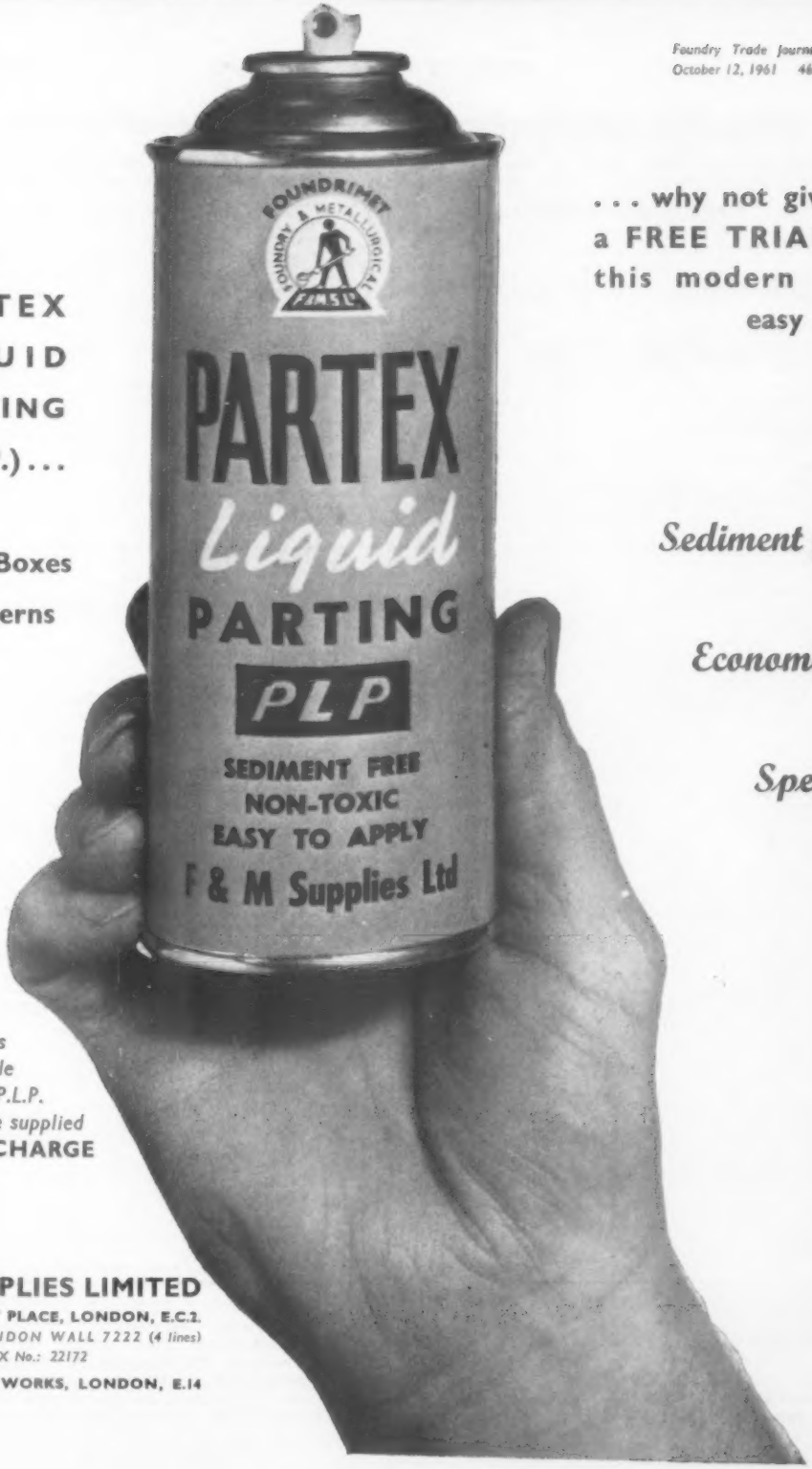

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Imports and Exports of Iron and Steel in August

The following tables, based on Board of Trade returns, give figures of imports and exports of iron and steel in August this year. Totals for the first eight months of 1960 and 1961 are also included.

Total Exports of Iron and Steel

Destination.	Month ended Aug. 31.	Eight months ended August 31.	
	1961.	1960.	1961.
	Tons.	Tons.	Tons.
Malta	211	4,216	3,459
Sierra Leone	737	3,512	7,184
Ghana	1,248	14,650	11,053
Nigeria	8,263	40,629	50,312
Union of South Africa	3,322	48,768	42,388
South-West Africa	1,935	5,020	11,351
Rhodesia and Nyasaland	1,532	18,240	21,680
Tanganyika	2,053	9,683	19,520
Kenya	2,234	20,027	27,817
Uganda	121	898	1,815
Mauritius	104	2,960	1,446
Bahrein, Qatar, and Trucial States	1,065	9,788	13,709
Kuwait	5,486	4,874	16,872
India	16,378	184,665	138,892
Pakistan	6,942	47,757	62,077
Singapore	1,703	12,967	17,746
Malaya	3,106	12,697	18,776
Ceylon	1,467	37,716	27,517
British North Borneo	777	3,292	2,112
Hongkong	8,969	58,233	58,787
Australia	4,786	117,362	92,555
New Zealand	9,018	75,096	166,236
Canada	7,435	155,724	87,501
Jamaica	978	15,445	11,042
Trinidad	3,199	28,159	30,384
British Guiana	720	6,219	6,429
Other Commonwealth countries	2,733	18,160	20,742
Eire	6,251	40,554	51,161
Soviet Union	10,156	22,917	23,918
Finland	5,117	32,537	41,092
Sweden	11,871	117,378	112,118
Norway	10,971	76,636	90,729
Denmark	9,578	65,928	70,146
Poland	11,337	7,155	28,915
Western Germany	10,135	97,393	75,889
Eastern Germany	1,535	15,087	17,467
Netherlands	5,963	82,944	84,114
Belgium	5,210	24,233	23,133
France	1,139	4,959	8,882
Switzerland	1,855	8,840	15,313
Portugal	1,703	10,525	17,725
Spain	2,643	35,742	16,788
Italy	8,184	28,734	48,765
Austria	468	3,361	3,664
Yugoslavia	1,015	28,339	20,926
Greece	2,417	12,566	24,635
Turkey	669	9,657	11,609
Netherlands Antilles	195	2,694	1,257
Portuguese East Africa	180	3,206	1,806
Egypt	1,707	9,570	22,185
Libya	7,672	20,847	13,458
Sudan	653	6,712	6,800
Israel	2,212	13,951	16,198
Saudi Arabia	170	345	992
Iraq	1,371	28,074	25,174
Iran	3,868	46,683	24,076
Burma	253	4,596	3,565
Thailand	544	3,794	3,991
Indonesia	76	18,190	2,735
China	314	37,457	10,411
Japan	10,046	49,698	114,588
Philippine Republic	588	5,861	3,440
USA	10,763	156,593	86,528
Cuba	—	5,840	801
Mexico	386	4,746	2,835
Colombia	755	6,151	8,149
Venezuela	2,518	26,463	19,771
Ecuador	354	2,054	2,118
Peru	977	4,526	6,117
Chile	163	3,144	2,350
Brazil	1,536	21,829	13,121
Uruguay	1,040	6,031	6,314
Argentina	11,215	59,349	116,304
Other foreign countries	4,568	40,288	49,162
TOTAL	268,863	2,270,914	2,321,237

GEO. SALTER & COMPANY, LIMITED—Mr. G. P. Bache has been elected to the board.

Total Imports of Iron and Steel

From	Month ended August 31.	Eight months ended August 31.	
	1961.	1960.	1961.
	Tons.	Tons.	Tons.
Union of South Africa	4,282	22,954	26,291
Rhodesia and Nyasaland	844	4,855	18,394
Canada	3,130	147,891	67,165
Other Commonwealth countries and Eire	460	30,609	33,927
Soviet Union	7,197	26,327	17,111
Sweden	2,902	31,378	32,967
Norway	6,934	100,068	76,619
Poland	—	8,261	652
Western Germany	1,170	101,271	18,143
Netherlands	7,815	141,288	77,313
Belgium	950	82,462	24,577
Luxembourg	—	10,864	10,130
France	2,028	49,654	14,455
Italy	163	21,028	466
Austria	516	9,298	3,784
Japan	372	4,495	4,774
USA	1,013	296,397	9,355
Other foreign countries	1,178	90,921	8,705
TOTAL	40,954	1,186,021	444,828
Iron and steel scrap and waste fit only for the recovery of metal	4,182	154,817	16,882

Exports of Iron and Steel, by Product

Product.	Month ended Aug. 31.	Eight months ended August 31.	
	1961.	1960.	1961.
	Tons.	Tons.	Tons.
Pig-iron	19,031	111,825	80,525
Ferro-columbium (niobium)	6	78	57
Ferro-tungsten	147	638	804
Other ferro-alloys	340	6,384	2,589
Ingots, blooms, billets, slabs, sheet bars (incl. tinplate bars) and similar primary forms	7,765	21,267	78,211
Pieces roughly shaped by forging	210	720	1,520
Iron bars, rods, angles, shapes, and sections	106	1,175	1,467
Steel bars, rods, angles, sections, and shapes	46,065	423,240	459,974
Iron plates and sheets	—	527	376
Universal plates	890	13,375	10,593
Steel plate, 3 mm. and under 4.5 mm. thickness	3,782	28,034	27,106
Ditto, 4.5 mm. or more in thickness	19,173	232,584	232,523
Blacksheets and blackplate	41,954	199,829	267,231
Hoop and strip	6,046	67,840	78,382
Tinplate	31,861	346,577	295,022
Decorated tinplate	718	3,562	4,675
Galvanized sheets	3,757	55,013	47,051
Other (incl. tinned sheets, terneplate, and ternesheets)	3,068	17,830	27,648
Railway and tramway construction material	14,649	115,985	138,819
Wire rods of steel (incl. alloy steel)	5,126	37,611	43,024
Wire	9,210	80,274	90,960
Tubes, pipes, and fittings	54,959	506,556	432,680
TOTAL	268,863	2,270,914	2,321,237

INTERNATIONAL HARVESTER COMPANY OF GREAT BRITAIN, LIMITED, has secured an order worth £500,000 from the Egyptian Government for earth-moving equipment, including crawlers, tractors and scrapers, to be used for the conversion of hundreds of square miles of desert into agricultural land.

New Patents

Descriptions of metallurgical patents given below have been taken from details published in the Official Gazette of the United States Patent Office.

851,098. Blaw-Knox Company, 300, Sixth Avenue, Pittsburgh, 22, Penna., USA.

A method of forming homogeneous cast-metal structures. The invention aims at reducing the amount of segregation, and the amount of dissolved gases and porosity. Claims are made for improved physical properties of the resultant metal.

851,166. E. Q. Sylvester, 490, College Road, Lake Forest, Illinois, USA.

This invention relates to improvements in methods and apparatus for the bottom pouring of metal into moulds with the aid of super atmospheric and/or sub-atmospheric pressures for effecting flow of molten metal from the reservoir into the moulds.

851,211. International Minerals and Chemical Corporation, 5401, Old Orchard Road, Skokie, Illinois, USA.

Foundry cores of high baked strength imparted by what is claimed to be a novel binder component consisting of between 10 and 75 per cent. by weight of gelatinized amylopectin, substantially free from amylose.

851,243. Foundry Services International, Limited, 285, Long Acre, Nechells, Birmingham, 7.

Processes for the control of solidification of the head metal in the production of castings and ingots. A preformed shaped, rigid or semi-rigid pack is provided for this purpose. It consists of a container having two superimposed layers, one of which contains a powdered or granular exothermic composition (such as "Thermit"). The other holds a heat-reisting gas-filter material (asbestos fibre or glass wool). The material of the container is such as to be destroyed or disintegrated when it comes into contact with the molten metal. The layers mentioned above are in contact or separated by a partition formed of a material which also is destroyed or disintegrated when it makes contact with molten metal. A claim for the container to be made of a synthetic plastic material, kraft paper or metal foil is also included in the Patent.

851,282. H. J. Daussan, 9, Avenue Leclerc de Hautecloque, Metz, Moselle, France.

Improvements in, or relating to, a device for providing a dead head in an ingot or similar, and apparatus for using this device.

851,849. Aluminium Laboratories, Limited, 1800, Sun Life Building, Montreal, Canada.

Light-metal pistons of the type in which the shape of the skirt part is controlled by means of inserts of a different metal.

852,424. Dortmund-Horder Huttenunion A.G., Rheinische Strasse 173, Dortmund, Germany.

Methods of desulphurizing cast-iron melts from a cupola. The melt is exposed to the influence of a vacuum at a pressure of less than 10 mm. of mercury.

852,780. Sunbeam Corporation, 5600, Roosevelt Road, Chicago, 50, Illinois, USA.

Composite electrically heated devices with means for making them. The Patent refers especially to sole plates for electric sadirons.

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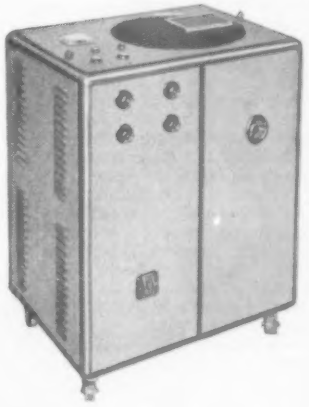

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Raw Material Markets

Iron and Steel

Most of the engineering and speciality foundries continue to obtain reasonably good outputs of high quality castings, but their order-books are now much lighter as arrears of work have been liquidated and forward bookings are scarce. From the motor car industry, the engineering and machine tool trades, steelworks, and other consumers fluctuating demands are being made, and while most of these foundries are able to maintain a five-day working week with the business now arising they would have difficulty in keeping production at this level should there be any further decline in demands.

Most of the light foundries continue only moderately employed. A steady call for castings is being made by the domestic utensil trade but this is nowhere near sufficient to enable them to keep plants fully occupied. The call for builders' castings is at fairly good levels; the jobbing foundries are continually in search of more work.

Pig-iron in all grades is plentiful and not for a long time past has the supply position been so easy. The low phosphorus irons mainly used by the engineering and speciality foundries are, comparatively, the most heavily in demand, and these foundries are also taking up fairly good quantities of hematite and some refined irons. High phosphorus irons are also in good supply. The steelworks are well provided with basic pig-iron, and although furnace production is well below capacity levels, outputs are more than sufficient to satisfy current demands. Fairly substantial consignments of the basic steelmaking pig-iron are being exported and other grades are also available for shipment abroad. While some business is being secured from overseas buyers, this is difficult to negotiate on account of the keen competition from makers abroad.

The foundries are able to cover for their needs of most grades of scrap, and they have no difficulty in obtaining other supplies.

Little change has taken place in the position at the re-rollers, and most of them are still striving to improve their outputs. Orders continue scarce for small bars, light sections, strip, etc., and business arising is barely sufficient to keep production at present levels. Reinforcing rods and bars are still in fairly good demand. Most of the re-rollers have fairly good quantities of steel semis on hand, and orders are being placed only for the supplies which are essential for current production requirements.

Demands from some re-rollers for prime material are very scarce, and home steelworks have no difficulty in satisfying these and could increase deliveries appreciably. Mild steel semis are very plentiful, and demands for carbon steels are easily satisfied. Alloy steel billets, etc., are also available but for more extended delivery. All arisings at the steelworks of suitable re-rolling defectives and crops are taken up.

Non-ferrous Metals

Copper in London was active last week. The reason for the sudden demand, which was concentrated on "cash" metal, is difficult to understand—unless it was that at nearly £220 a ton the price was considered cheap. Certainly there were no other basic changes apart from the small change in the Bank Rate. In fact, metal in LME warehouses is more than adequate and ample supplies are still coming into the country. The outlook has not, therefore, changed and if the present level of prices is to be sustained it will probably require support from the producers. In the US the market is quietly steady but featureless with the quotation for both producers and custom smelters unchanged at 31 cents a pound.

Tin is still marking time in front of the communiqué expected from the meeting of the International Tin Council held in London this week. Meanwhile there is a certain amount of apprehension about the next sale of GSA metal in the United States, Singapore is fluctuating uncertainly but trending lower and the quotation in all three centres is easing owing to the lack of steady demand. The US spot price is moving narrowly around $1.20 cents a pound.

Lead has been acting in sympathy with copper, but there is no real support for the market and the price is drifting down towards £62 a ton. The market in the United States is reasonably good although the Ford Motor strike has damped consumer activity. The price is unchanged at 11 cents a pound.

Zinc after being subjected to selling by the Russians and by the Commonwealth producers has hardened and the price is holding at around £71 a ton. It is thought that the market would continue to behave in an uncertain manner until the outcome of this month's conference in Geneva. The US market is quiet with the quotation unchanged at 11½ cents a pound.

Increases of Capital

WILLIAM FIRTH (TOOLS), LIMITED, Leeds, increased by £4,900 in £1 ordinary shares, beyond the registered capital of £100.

GUEST KEEN IRON & STEEL COMPANY, LIMITED, Cardiff, increased by £9,500,000 in £1 ordinary shares, beyond the registered capital of £5,000,000.

J. HOSKIRK SONS & COMPANY, LIMITED, ironfounders, etc., of Bedford, increased by £60,000 in £1 ordinary shares, beyond the registered capital of £60,000.

MARKHAM & COMPANY, LIMITED, ironfounders, etc., of Chesterfield, increased by £150,000 in £1 ordinary shares, beyond the registered capital of £600,000.

ANDERTON SPRINGS, LIMITED, engineers, founders, etc., of Bingley (Yorks), increased by £3,000 in £1 ordinary shares, beyond the registered capital of £6,000.

METALRAX (CONVEYORS), LIMITED, conveyor manufacturers, etc., of Birmingham, increased by £8,000 in £1 ordinary shares, beyond the registered capital of £2,000.

RANSOME & MARLES BEARING COMPANY, LIMITED, Newark on Trent (Notts), increased by £2,000,000 in 5s. ordinary shares, beyond the registered capital of £2,000,000.

W. P. BUTTERFIELD (ENGINEERS), LIMITED, tank manufacturers, etc., of Shipley, increased by £499,900 in £1 ordinary shares, beyond the registered capital of £100.

ENDECOTTS (FILTERS), LIMITED, ironfounders, mechanical engineers, etc., of London, S.W.19, increased by £55,000 in £1 ordinary shares, beyond the registered capital of £5,000.

C. H. EDWARDS, LIMITED, brassfounders, etc., of Millfields, nr. Wolverhampton, increased by £100,000 in £1 ordinary shares, beyond the registered capital of £100,000.

NEWTON, CHAMBERS & COMPANY, LIMITED, engineers, ironfounders, etc., of Thorncliffe, nr. Sheffield, increased by £500,000 in £1 ordinary shares, beyond the registered capital of £3,000,000.

It is regretted that our September 21 issue reported under this heading that Qualcast, Limited, of Derby, had recently increased their capital by £1,000,000 in 5s. ordinary shares beyond the registered capital of £2,075,000. This is an unfortunate repeat of information published after the 1960 annual general meeting. Apologies are offered to readers and to the company for any inconvenience caused them by the announcement.

Exhibition

At the 1961 Motor Show, to be held at Earls Court, London, October 18 to 28, on stand number 402 the International Nickel Company (Mond), Limited, will be showing instruments designed to test, non-destructively, the thickness of nickel/chromium plating. The company's labelling scheme for quality-plated articles will be demonstrated and the customer in the shop or garage advised how to recognize quality-plated components.

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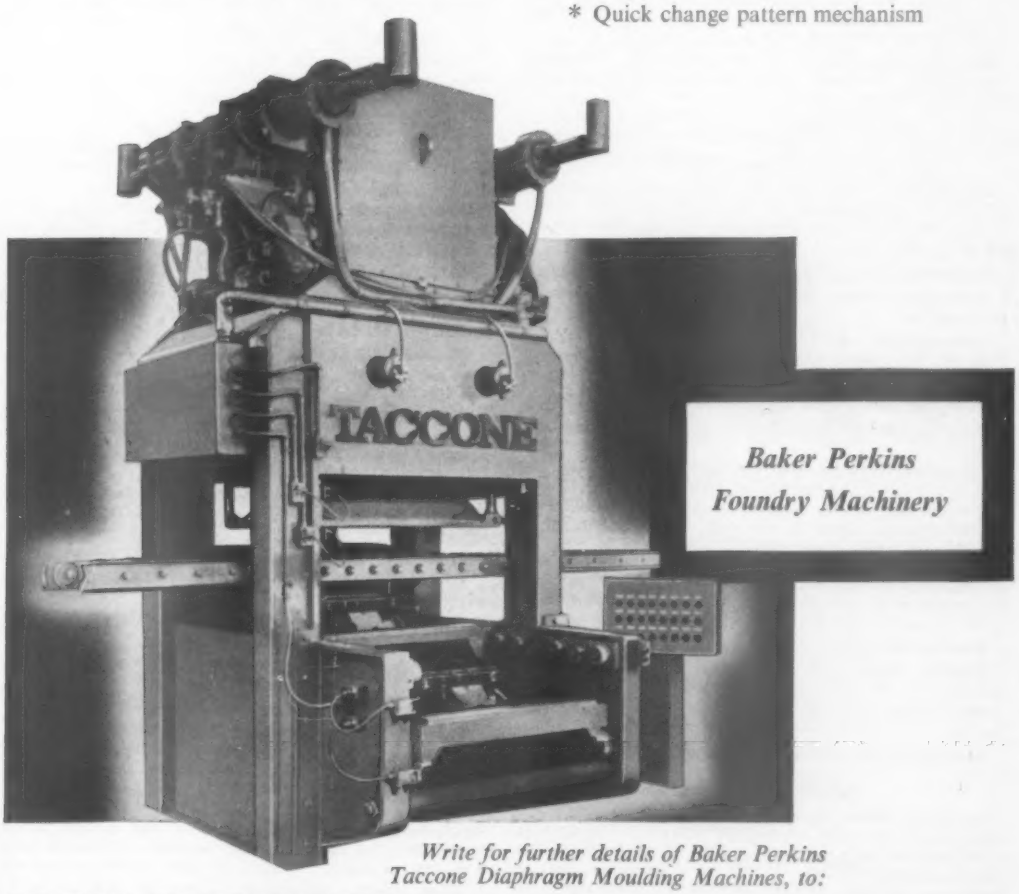

Write for further details of Baker Perkins Taccone Diaphragm Moulding Machines, to:

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Foundry Machine Department, Bedewell Division, Hebburn-on-Tyne, Co. Durham. Tel. Jarrow 897124

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Current Prices of Iron, Steel, and Non-ferrous Metals

(Basis prices, delivered unless otherwise stated. Prices following side headings marked* are subject to an increase of 1 per cent. under Iron and Steel Board Price Determination, 1961, No. 2.)

October 11, 1961

PIG-IRON

* **Foundry Iron.**—No. 3 IRON, CLASS 2, 10-ton lots or over, Middlesbrough, £21 17s. 0d.; Birmingham, £21 9s. 3d.

* **Low-phosphorus Iron.**—Over 0.10 to 0.40 per cent. P, 10-ton lots or over, £23 5s. 0d., delivered Birmingham; £23 10s. 0d., delivered Grangemouth.

Cylinder and Refined Irons.—North Zone, £25 6s. 6d.; South Zone, £25 9s. 0d.

Refined Malleable.—P, 0.10 per cent. max.; North Zone, £26 6s. 6d.; South Zone, £26 9s. 0d.

* **Hematite.**—Si less than 2 per cent, S. & P. over 0.03 to 0.05 per cent., 10-ton lots or over: N.-E. of England (local iron), £23 19s. 0d.; Scotland (Scotch iron), Zone S.1, £24 5s. 6d.; Sheffield, £25 9s. 0d.; Birmingham, £25 13s. 0d.; South Wales (Welsh iron), £23 19s. 0d.

* **Basic Pig-iron.**—£20 3s. 0d., delivered Staffs, Derbyshire, Notts, Lincs, Rutland, Northants, and Leicestershire in 10-ton lots or over.

FERRO-ALLOYS

(per ton unless otherwise stated, delivered)

Ferro-Silicon (6-ton lots and over).—45 per cent. Si, £45 0s. 0d. to £48 0s. 0d., scale 15s. 0d. per unit, lumpy, 75 per cent. Si, £62 10s. 0d. to £66 10s. 0d., scale 15s. 0d. per unit, lumpy.

Ferro-vanadium.—50/60 per cent., 22s. 6d. per lb. of V.

Ferro-molybdenum.—65/70 per cent., carbon-free, 14s.1d. per lb. of Mo.

Ferro-titanium.—20/25 per cent., 2-3 per cent. Cu, £250 0s. 0d.; 38/40 per cent., commercially carbon-free, £287 0s. 0d.

Ferro-tungsten.—80/85 per cent., 9s. 11d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 12s. 11d. per lb. of W.

Ferro-chrome (6-ton lots and over, lumpy).—4/6 per cent. C, £80 10s. 0d. to £84 10s. 0d., basis 60 per cent. Cr scale 27s. 0d. to 28s. 6d. per unit; over 6 per cent. C, £79 0s. 0d. to £82 10s. 0d., basis 60 per cent. Cr, scale, 27s. 0d. to 28s. 6d. per unit; 2 per cent. C,* 1s. 8d. to 1s. 11d. per lb. Cr; 1 per cent. C,* 1s. 8d. to 1s. 11½d. per lb. Cr; 0.15 per cent. C,* 1s. 9½d. to 2s. 0½d. per lb. Cr.; 0.10 per cent. C,* 1s. 9½d. to 2s. 0½d. per lb. Cr; 0.06 per cent. C,* 1s. 10½d. to 2s. 1d. per lb. Cr. * Average 68-70 per cent.

Metallic Chromium.—98/99 per cent., 6s. 9d. per lb.

Metallic Manganese.—94/96 per cent., carbon-free, £275 0s. 0d.; 96/98 per cent., £285 0s. 0d.

Ferro-columbium.—65/67 per cent. Cb + Ta, 19s. 0d. per lb., Cb + Ta.

Ferro-manganese (Standard).—78 per cent., £58 10s. 0d.

SEMI-FINISHED STEEL

* **Re-rolling Billets, Blooms, and Slabs.**—BASIC: Soft u.t., 100 tons and over, £31 15s. 6d.; tested, 0.08 to 0.33 per cent. C, 100 tons and over, £32 5s. 6d.; hard (0.41 to 0.60 per cent. C), 50 tons and over, £33 17s. 0d.; silico-manganese, 50 tons and over, £42 16s. 6d.; free-cutting, 50 tons and over, £35 4s. 6d. SIEMENS MARTIN ACID (50 tons and over): Up to 0.25 per cent. C; £40 11s. 0d.; silico-manganese, £43 4s. 0d.

* **Billets, Blooms, and Slabs for Forging and for Stamping** (50 tons and over).—BASIC: Soft, up to 0.33 per cent. C, £37 0s. 0d.; basic, hard, over 0.41 up to 0.60 per cent. C, £38 2s. 6d.; acid, up to 0.25 per cent. C, £41 14s. 0d.

FINISHED STEEL

* **Heavy Plates and Sections** (50 tons and over).—Ship plate (N.-E. Coast), £40 7s. 0d.; boiler plates (N.-E. Coast), £42 17s. 0d.; floor plates (N.-E. Coast), £41 16s. 0d.; angles (N.-E. Coast), £38 1s. 6d.; joists (N.-E. Coast), £37 17s. 6d.

* **Small Bars, Sheets, etc.**—Rounds and squares, under 3 in., and flats 5 in. wide and under, untested soft basic, 50 tons and over, £39 1s. 0d.; under 10 tons to 4 tons, £40 18s. 6d.; under 4 tons to 2 tons, £41 3s. 6d.; hoop and strip, coils, 100 tons and over, £38 0s. 0d.; uncoated strip mill coils, hot rolled, under 3 mm. to 12g., 25 tons to under 50 tons, £43 16s. 0d.; black sheets (hand mill), 24g., 10 tons and over, £57 14s. 6d.; galvanized corrugated sheets, 24g., 10 tons and over, £67 4s. 0d.

Alloy Steel Bars.—1 in. dia. and up: Nickel, £67 16s. 0d.; nickel-chrome, £100 18s. 0d.; nickel-chrome-molybdenum, £113 11s. 0d., in lots of 25 tons and over.

NON-FERROUS METALS

Copper.—Cash, £228 15s. 0d. to £229 0s. 0d.; three months, £229 5s. 0d. to £229 10s. 0d.; settlement, £229 0s. 0d.

Copper, Tubes, etc.—Solid-drawn tubes, 2s. 2½d. per lb. rods, 242s. 6d. per cwt. basis; 20 s.w.g., 288s. 0d. per cwt.

Tin.—Cash, £941 0s. 0d. to £942 0s. 0d.; three months £952 0s. 0d. to £953 0s. 0d.; settlement, £942 0s. 0d.

Lead (Refined Pig).—First half October, £63 2s. 6d to £63 5s. 0d.; first half January £64 2s. 6d. to £64 15s. 0d. settlement, £63 5s. 0d.

Zinc.—First half October, £71 15s. 0d. to £71 17s. 6d.; first half January, £72 17s. 6d. to £73 0s. 0d.; settlement, £71 17s. 6d.

Zinc Sheets, etc.—Sheets, 15g. and thicker, all English destinations, £109 17s. 6d.; rolled zinc (boiler plates), all English destinations, £107 12s. 6d.; zinc oxide (Red Seal); d/d buyers' premises, £90 0s. 0d.

Brass Tubes, etc.—Solid-drawn tubes 1s. 9½d. per lb.; sheets to 10 w.g., 195s. 0d. per cwt.; wire, 2s. 8½d.; rolled metal, 195s. 0d. per cwt.

Brass (Brazing).—BS1400, SCB2, £176; SCB3, £171.

Brass (High Tensile).—BS1400, HTB1, £194; HTB2 £213; HTB3, £228.

Gunmetal.—BS1400, LG2, £212; LG3, £222; G1, 1½% £283; G1 ½% £296.

Phosphor Bronze.—BS1400, PB1 (AID released), £314; PB4 £301; BS1400, 90/10/1%, £300.

Leaded Phosphor Bronze.—BS1400, LPB1, £236.

Phosphor Bronze Strip, etc.—Strip, 296s. 3d. per cwt.; wire, 4s. 2½d. per lb.; rods, 3s. 4½d.; tubes, 3s. 4¾d.; chill cast bars, solids 3s. 5d.; cored, 3s. 6d. (CHARLES CLIFFORD LIMITED).

Nickel Silver, etc.—Rolled metal, 3 in. to 9 in. wide × 0.056, 3s. 11½d. per lb.; round wire, 10g. in coils (10 per cent.), 4s. 4½d.; special quality turning rod, 10 per cent., ½ in. dia., in straight lengths, 4s. 3½d. All prices are net.

Other Metals.—Magnesium, ingots, 2s. 2½d. to 2s. 3d. per lb.; Antimony, English, 99 per cent., £230 0s. 0d. Quicksilver, ex-warehouse, £62 0s. 0d. Nickel, £660 0s. 0d. Aluminium, ingots, £186 0s. 0d.; aluminium bronze (BS1400), AB1, £238; AB2, £245.

Company News

WILLIAM SUGG & COMPANY, LIMITED, engineers, of London, S.W.1—Profits expanded to £171,720 (£129,173) and the dividend is raised by 5 per cent. to 27½ per cent., with a final of 17½ per cent. A one-for-three scrip issue is proposed.

JOSIAH PARKES & SONS, LIMITED, makers of locks and brassfounders, of Willenhall (Staffs)—Group turnover and profit for the first half of 1961 both show an increase over the corresponding period of 1960, and indications are that this will continue during the second half of the year, it is stated.

STAVELEY INDUSTRIES, LIMITED (formerly the Staveley Coal & Iron Company, Limited)—Group profits contracted to £1,385,404 (£1,675,843) and net profits to £601,659 (£832,970). Much of the reduction was due to higher research and development expenditure and to non-recurring losses. The dividend is held at 11 per cent., with a final of 8 per cent.

INDIAN IRON & STEEL COMPANY, LIMITED—At the annual meeting in Calcutta, Sir Biren Mookerjee, the chairman, said the company, despite operational problems, had achieved a production of iron and steel amounting to about 90 per cent. of the rated capacity under normal working conditions in the year to March 3, 1961. He added that no steel expansion was currently under consideration, but might have to come later. There is a likelihood of another spunpipe scheme, details of which were expected in the near future.

A. A. JONES & SHIPMAN, LIMITED, engineers and machine-tool makers, of Leicester—Profits for the first half of the current year are in excess of the average monthly profits for the same period in 1960, and current intake of orders is still in excess of the monthly output, states Mr. F. G. Morris, chairman. He forecasts a final dividend of "at least" 15 per cent., if there are no untoward national or international events. This would make the 1961 total 20 per cent. on the doubled capital compared with the previous equivalent to 18½ per cent.

TECALEMIT, LIMITED, lubrication, hydraulic and filtration engineers, of Feltham (Middx)—The directors announce the offering of the remaining 1,244,252 5s. ordinary shares at 13s. each to ordinary holders registered on September 18 to raise £808,000. One-for-four rights will require 1,188,937 for the provisional allotments. Excess share applications will be invited. The new shares will not rank for the final dividend of 12 per cent. which the directors expect to recommend on the present ordinary capital. An interim dividend of 6 per cent. has already been paid.

QUALCAST, LIMITED, light repetition steel and iron-founders, of Derby—Order books are satisfactory and the proportion of products exported continues to grow, states Mr. Vincent Jobson, chairman, who adds, however, that he cannot give a forward forecast because of the disturbed international picture. All previous figures were beaten in the year ended June 30, 1961, when group profits, before tax, increased by £100,041 to £1,411,824. The chairman says it has been the intention of the board to recommend an increased dividend, but it decided to follow the Chancellor's request for restraint.

LINCOLN BRANCH OFFICE of United Dominions Trust, Limited, has moved to new premises in St. Swithin's Square, Thorngate.

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SITUATIONS WANTED

YOUNG MAN—live wire—wants more lucrative position. Now earning £1,800 p.a. as Foundry Director. A.I.M., M.I.B.F. Box YM962, FOUNDRY TRADE JOURNAL.

EXPERIENCED non-ferrous ingot and scrap representative seeks position. Preferably in Midland area. Proven sales record.—Box EN7, FOUNDRY TRADE JOURNAL.

TECHNICAL-SALES REPRESENTATIVE, 53, lifetime foundry trade, available shortly, wishes salaried representation Midlands. Car. Box TS991, FOUNDRY TRADE JOURNAL.

FOUNDRY MANAGER. Foreman, 53, life in trade, full knowledge all departments, wants position immediately, West Midlands only. Box FM990, FOUNDRY TRADE JOURNAL.

ALUMINIUM DIE CASTS.—FOUNDRY ENGINEER, A.M.I.B.F., 25 years' practical experience in gravity die castings, centrifugal casting, die design and manufacture, shell mould core making, some knowledge of pressure die casting, seeks change to smaller company where expansion is possible. B'ham area preferred. Box AD975, FOUNDRY TRADE JOURNAL.

FOUNDRY MANAGER (49) seeks position on commercial side of castings industry. Can offer sound experience in sales and liaison. Personal contacts over a wide area and range of industries. A fully trained foundryman in all aspects of the industry. Prepared to be based anywhere but would prefer southern half of England. Box FM1, FOUNDRY TRADE JOURNAL.

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GENERAL MANAGER (Foundry) seeks position. Administration covers sales, customer contact, estimating, quoting, production control, bonus systems, large and small castings. Metallurgical control, blackheart, whiteheart, grey irons and steels and non-ferrous. Box GM982, FOUNDRY TRADE JOURNAL.

FOUNDRY MANAGER—HEAD FOREMAN, age 50, life experience trade, jobbing, repetition, ferrous, non-ferrous, thoroughly practical, technical, commercial, able improve output, quality, obtain business, wish join immediately small Midland or Welsh Foundry. Box FM6, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT

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IRON MOULDER wanted for jobbing, Iron Foundry 30 miles London. Permanent position for good man. Apply stating age and experience. Box IM8, FOUNDRY TRADE JOURNAL.

CANADIAN OPPORTUNITY. Foundry Machinery Sales Engineer urgently required for permanent residence. Preferably single and probably based Montreal or Toronto. Superb chance for ambitious energetic man. Only applicants who have proved selling experience to foundries will be considered. Box No. 636, Dorland Advertising Ltd., 28 Haymarket, S.W.1.

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Enquiries should be sent to: The Director, The British Cast Iron Research Association, Bordesley Hall, Alvechurch, Birmingham.

SITUATIONS VACANT—*contd.*

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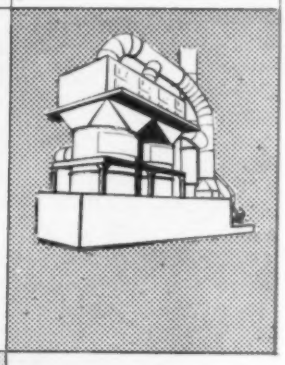

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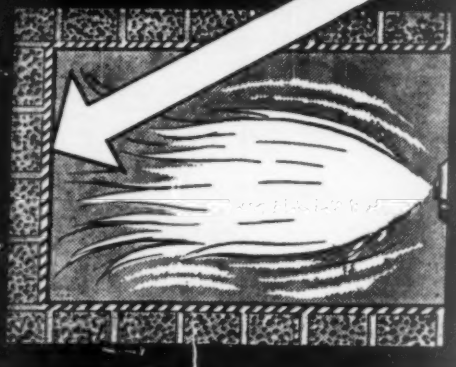

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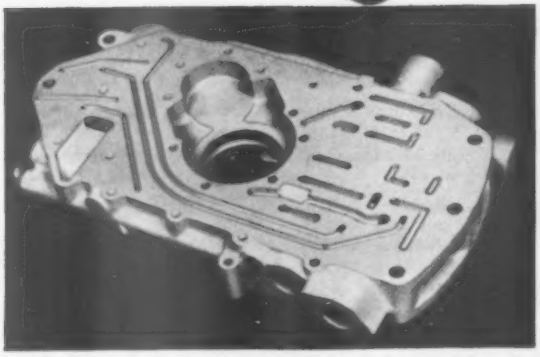

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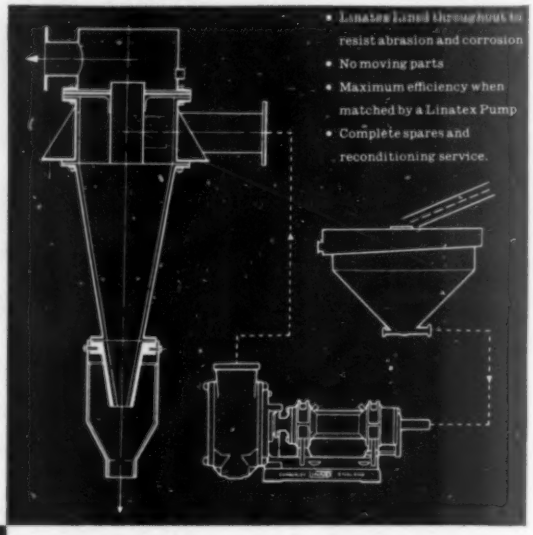
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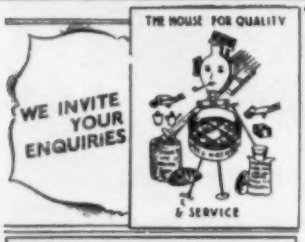

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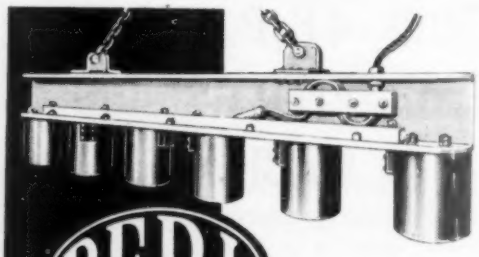
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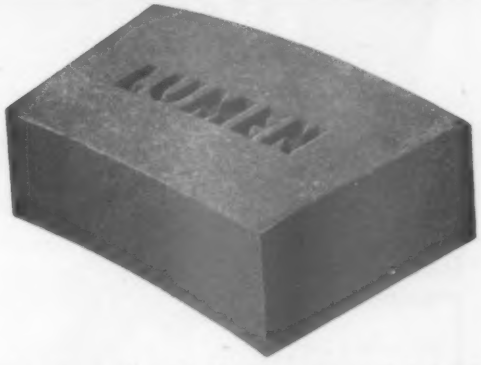

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